

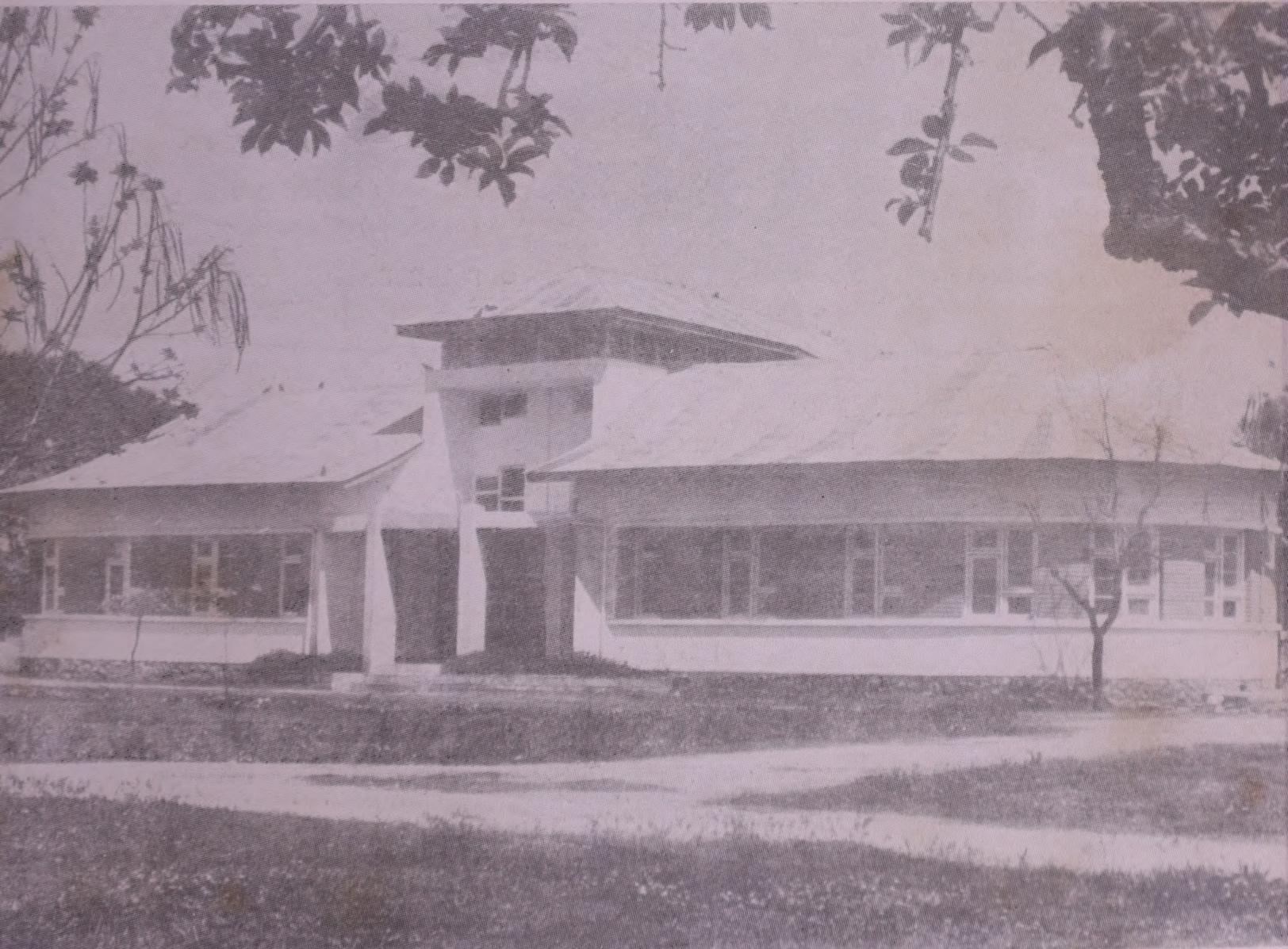
University News

MONDAY, OCTOBER 2, 1989

Rs. 5.00

Association of Indian Universities

64th Annual Meeting
October 4-8, 1989



Our Hosts : University of Kashmir, Srinagar

INTERNATIONAL ASSOCIATION OF UNIVERSITIES
INTERNATIONAL UNIVERSITIES BUREAU
ASSOCIATION INTERNATIONALE DES UNIVERSITES
BUREAU INTERNATIONAL DES UNIVERSITES

IAU AT A GLANCE

The International Association of Universities, founded in 1950, is a world-wide organization of nearly 1,000 member universities in over 120 countries. Its permanent Secretariat, The International Universities Bureau (IUB) with headquarters at Unesco House in Paris, provides a wide variety of services to member institutions.

Activities and Services

- IAU-Unesco Information Centre and Clearing-house on Higher Education
- Meetings, seminars
- Research and studies
- Promotion of academic mobility
- Credential evaluation
- Exchange of publications and materials
- Sponsorship of International Student Identity Card and International Academic Card

Publications

- International Handbook of Universities
- World List of Universities
- World Guide to Higher Education (prepared by IAU, published by Unesco)
- Studies and Monographs
- Higher Education Policy (quarterly)
- IAU Bulletin (bimonthly)

Major Meetings Open to All Members

- Five-yearly General Conference. Determines IAU general policy and serves as a major forum on international higher education issues.

Ninth General Conference : 5-11 August, 1990

University of Helsinki

Theme : Universality, Diversity, Interdependence :

The Missions of the University

- Mid-Term Conference of Heads of Member Universities held between General Conferences.

Rio de Janeiro 1988

Theme : International University Co-operation,

A Critical Analysis :

Failures, Successes, Perspectives

* * *

Dues Structure (per calendar year)

Over 10,000 students	\$1,700
5,000 to 10,000 students	\$1,300
1,000 to 5,000 students	\$ 900
Under 1,000 students	\$ 700

UNIVERSITY NEWS

VOL. XXVII **OCTOBER 2**
No. 40 **1989**
Price **Rs. 5.00**

A Weekly Chronicle of Higher Education published by the Association of Indian Universities

IN THIS ISSUE

University Finances	
Government-Varsity Partnership	9
Resource Allocation and Financial Accountability	17
Restructuring Organisational Structure of Universities in India	23
Undergraduate Colleges	39
Effective Teaching in Colleges	43
Distance Education	53
Convocation	
University of Kashmir, Srinagar	65
News from Universities	
Nehru Centenary Celebrations at JNTU	67
M. Tech. in Atmospheric Sciences	68
Special Assistance for JNU Centre	69
Agriculture	
AFST Founder's Day	70
Programme on Improved Agrl. Machinery	70
News from UGC	
Nominations for Commonwealth Awards	71
Current Documentation in Education	75
Theses of the Month	76
Classified Advertisements	93

Opinions expressed in the articles are those of the contributors and do not necessarily reflect the policies of the Association.

Editor :
SUTINDER SINGH

UNIVERSITY FINANCES

The Association of Indian Universities (AIU) meets in its 64th Annual General Session at University of Kashmir, Srinagar on 4-8 October, 1989. University Finances has been chosen as the theme for the Group Discussion at the Annual Meeting. The following background paper has been prepared by the Economics of Education Unit of the Research Cell of the Association.

The National Policy on Education (1986) states that higher education "contributes to national development through dissemination of specialized knowledge and skills. It is, therefore, a crucial factor for survival". The policy document further observes that "development oriented objectives of Indian society can be realized only by making investments in education of an order commensurate with the nature and dimension of the task". As the nature and dimension of socio-economic and cultural factors having significant bearing on the quality of life of people, have always been complex, the search for solutions for bringing about desirable improvements in economic and social environment has been a continuing process of the planning system in which the role of human resource development through education is duly emphasised for ensuring social transformation and attaining economic *Nirvana*.

The development of human resources, the impact of which is intense and pervasive on all sectors of growth, is closely associated with the system of providing education and training in skills. The effectiveness of the education system, is however, primarily dependent on the availability of adequate finances to meet the requisite costs of the provision for the development of higher education and research. The system of higher education, being chiefly responsible for preservation, generation and dissemination of knowledge and skills of the highest order, exercises a determining influence on the socio-economic and cultural development of the country. A large financial contribution (i.e. about three-fourths of the total educational finance) by the government for the development of higher education is undoubtedly a strong expression of this belief as also that the diverse forms and programmes of higher education ought to be made available to all those who are capable of benefitting from new knowledge and technical know-how so that the manpower requirements of various sectors of the economy could be duly provided for to expedite the process of national development.

When contemplating the challenges that India confronts today and thinking in terms of imperatives of revitalizing the Indian society, the advantages of advanced research and technology become self-evident. As compared to other countries including those of the Third World, the number of scientific and technical manpower per thousand of population is among the lowest, about 4, for India. In other words, the proportion of labour force with post-secondary education in the total labour force is lower than that of several developing countries. This is inspite of the fact that the proportion of educated manpower (i.e. matriculates and above) in the total labour force has increased from 3 per cent in 1961 to 12 per cent in 1981, which is substantially lower as compared to several developing countries. This means that the scarce

financial and capital resources, which have been invested during different plan periods, have been manned largely by unskilled, untrained and other personnel having less than desired level of managerial and entrepreneurial capacity. Obviously this must have impinged upon economic growth due to the adverse impact of unskilled and untrained personnel on productiveness of various factors of production. In essence, a capital starved country like India, has to rely on her vast human resources which have immense potential for increasing productivity and production provided adequate education and training in skills is imparted to them to provide proper orientation and motivation not only to venture into various productive activities but also to ensure efficient utilization of investible resources.

In such conditions as faced by India of today, the health and vitality of higher education and research is crucial not only to the part this country has to play in the comity of nations but also to tackle successfully the challenges that confront it. It also means that the development of higher education would determine the extent of success in improving the social and economic standards of people as well as in facilitating the task of laying solid foundation for maintaining a high quality of life over a long period of time. It is, therefore, imperative that deficiencies in financing universities and colleges, which impinge upon the effectiveness of higher education and research, should be identified and rectified. This is the main concern of this paper.

Major Deficiencies

There are three major deficiencies which need to be highlighted. First, there is inadequacy of finances available to universities and colleges. Despite the substantial contributions which the Central and the State governments are making towards the financing of higher education and research, the finances of universities and colleges are inadequate as they have not increased commensurately with the rise in enrolment and the increased requirements for modernisation and diversification of tertiary education. Second, there are stresses and strains in Centre-State budgetary relations which have come to affect the financing of universities and colleges due mainly to disproportionate distribution of fiscal powers and responsibilities in respect of development projects. The existing arrangements under which the Centre and the States are financing universities and colleges have quite often given rise to diverse and dilatory practices and

procedures between the two levels of government so much so that the attention of the governments gets diverted from ensuring a sound financial base for the institutions of higher learning. Third, the priorities within higher education have been somewhat distorted. In our attempt to equalize educational opportunities, too little attention has been paid to the nurturing of excellence in higher education and promotion of research which are crucial for raising productivity in every sphere of human activity and increasing the tempo of development. While the attainment of the equal educational opportunity has been an elusive objective, as more than 80 per cent of the beneficiary groups are drawn from the top 30 per cent of the income group, the quality and relevance of higher education has also been deteriorating fast as is evident from the growing problems of graduate unemployment and mismatch between education and jobs. In view of the above three broad categories of problems, educational finances becomes an interesting area of economic study especially for the students of development economics and public finance who are necessarily concerned with the allocative efficiency and distributive justice of public funds.

The Dimensions

The discussion in the following paragraphs will focus on the nature and extent of deficiencies in the system of providing funds for higher education. The important among them are :

1. Declining Expenditure Ratio

The proportion of GNP made available for higher education has increased from 0.43 per cent to 0.58 per cent as against an increase of 2.62 per cent to 4.12 per cent for the overall education sector for the period of 1970-71 to 1983-84. The relative increase in the latter was, thus at a higher rate than the former. While the expenditure on higher education grew at the rate of 6.3 per cent per annum at 1970-71 prices, the corresponding increase in enrolment was recorded at 4.1 per cent per annum. There was thus marginal increase in expenditure in real terms which is due largely to the heavy weight of salaries of teachers, about 60 per cent, in the total higher educational budget. The inadequacy of this increase in the overall expenditure on university education can however be gauged by the fact that a number of universities have to operate under deficit budgets. As a result, they are constrained either to postpone the initiation of innovative and productive educational programmes or to go

slow on the schemes already undertaken by them. Rather, in cases of most departments of universities, new programmes are rarely launched. Such handicaps obviously impinge upon the modernisation of higher education system, and, consequently, upon its contributions to development.

Comparisons between education and other sectors of development show that the plan allocations for education have come down to 3.5% in the seventh plan as against 7.6% in the First Plan. Within the education sector, allocations for higher education reveal a great deal of fluctuations and indicate a steady decline over the Plan periods. These evidences demonstrate that higher education has received a lower priority over the successive plans.

2. Relationship Between Expenditure and Income

The relationship between expenditure on universities and State Domestic Product for a cross-section of the States reveals that increase in expenditure on higher education due to rise in income has been less than proportionate. In order to estimate income elasticity of expenditure for a cross-section of States, three-year average data on expenditure on higher education was regressed on the corresponding state Domestic Product for the period 1980-81 through 1981-83. The elasticity co-efficient emerged out to be 0.75. When the price effect was netted out from both the series using income deflator, the co-efficient was found to be marginally lower; it was 0.72. In terms of both nominal and real costs, the above results demonstrate that the resources being allocated by the States for higher education have not been increasing in proportion to the rise in State incomes. The results, therefore, indicate that there is built-in bias in the prevailing mechanism of allocation of resources for higher education and the priority attached to its development is much less than desirable.

3. Declining Central Contribution

An analysis of sources of income reveals that at least three-fourths of university expenditure is met by the Central and State Governments and the remaining portion is financed by fees (about 17 per cent), endowments, donations, etc. The role of the Centre in funding higher education is, however, declining which is apparent from the fact that the contributions of the Centre and the States were roughly in the ratio of 23 : 77 respectively in 1982-83 as against the ratio of 39 : 61 in 1972-73. Thus, there has been considerable decline in the contribution of the Centre

for the development of higher education. It is important to note that education was included in the Concurrent List of the Constitution in 1975 with a view to ensuring the sharing of the responsibility between the Centre and the States. The declining trend in Centre's contribution to the development of higher education belies the expectations aroused from the above provision that the Centre should play a leading role in expanding and diversifying higher education. Also, because the fiscal capacity of the Centre is relatively more than that of the States as is borne out by several studies on the subject, it justifies for a higher financial assistance by the former for strengthening institutions of higher learning. The lack of adequate contribution by the Central Government is likely to retard the balanced development of higher education and research of the priorities of the States and their fiscal capacities widely differ. This is duly ascertained from the pattern of allocation of resources by the States for education vis-a-vis other sectors of development.

4. Finance Commission's Estimates of Expenditure

The transfer of financial resources from the Centre to the State Governments has not kept pace with the increase in expenditure on education even though the responsibility of financing education largely devolves on the States. The evidences demonstrate that the Finance Commissions' estimates of the budgetary requirements of the States are inconsistent with the actual requirements of the States. It has also been observed that even the States' forecasts do not adequately represent their own actual requirements. Comparisons between estimated requirements and actual expenditure for the periods covered by the Sixth and Seventh Finance Commissions reveal considerable under-estimations to the tune of 38 per cent and 21 per cent by the respective Commissions whereas the corresponding under-estimations by the States were of the order of 35 and 6 per cent respectively.

The intensity of such an incidence might be higher in the economically backward States which also happen to be educationally backward.

5. Inter-State Disparities

Inter-State disparities, as expressed in terms of co-efficient of variations, have been widening in terms of both the availability of the percentage share of State Domestic Product for Education as well as the per pupil expenditure on higher education. The

obvious reason is the lack of a uniform and consistent approach across the States in financing the system of higher education as well as differences in the stages of their economic developments. This also reveals, as noted above, inadequate Central intervention for rectifying educational disparities among the States through the mechanism of equitable distribution of funds from the Central pool of resources.

6. Declining Contributions of Tuition Fee

Tuition fee as a proportion of the total revenue for universities and colleges has been declining. One of the main reasons for this is the inelastic nature of fee structure adopted by the Central and the State Governments, under which the quantum of fees bears no relationship either with the escalating costs of higher education or with the increasing financial requirements for providing relevant and qualitatively better education or with the economic levels of beneficiary groups of people.

Likewise, the cost of other facilities are hardly recovered from the beneficiary students. A number of institutions of higher learning attach significant priority to the provision of residential accommodation to the scholars for different laudable reasons. The room rent and other user's charges realised from the students are very nominal which do not even cover expenses on electricity, water, cleaning, etc. The quantum of university deficits thus gets magnified.

7. Disparity in Per Student Cost

A time series and cross-section analysis of per student expenditure on higher education reveals the following :

- (a) Per student cost of higher education varies considerably across different types of institutions. For instance, the annual average cost (for three-year data resting on 1977-78) at 1970-71 prices shows that the average per student institutional cost was Rs. 3,230 for universities, Rs. 8,910 for Deemed Universities Rs. 13,149 for Institutions of National Importance, Rs. 15,196 for Research Institutions, Rs. 452 for colleges of general education, Rs. 1884 for colleges of professional education, and Rs. 337 for colleges of other education.
- (b) The trend of change in per student cost of higher education over a period of 10 years de-

monstrates that whereas per student cost (in real terms) has been declining for universities, the same is, however, rising for other types of institutions.

- (c) While a number of factors such as the nature of study programme, duration of courses and number of students, etc., are attributable to affecting per student cost of education the source of funding is equally important in influencing the cost of education. For instance, of the entire enrolments in higher education about 85 per cent are catered to by the colleges which are largely financed by the States. Similarly, most of the universities are also supported by the States. In both these cases, per student cost is much lower than other types of institutions like Deemed to be Universities and Institutions of National Importance which are financed by the Central sources like University Grants Commission and the Department of Education of the Ministry of Human Resource Development. The point being made here is that even though there are considerable similarities in some of the courses of study offered by different colleges/universities/institutions & there is theoretical parity of certificates/diplomas/degrees offered by them, the magnitude of per student expenditure on education varies significantly since the funding agencies are different; implying thereby differences in their financial capacity to fund educational programmes and the methods of allocation of resources. It appears that there is no uniform approach to equalize educational investments on comparable courses of study with a view to minimising distortions in quality of education as well as to ensuring the efficiency of the system.
- (d) Comparisons of per student costs of education for a sample of the State universities indicate considerable variations. For example, the lowest per student institutional cost in 1981-82 for universities in the sample was observed to be Rs. 3,356 for a university of the State of Tamil Nadu, while the highest was Rs. 20,109 for a university of Maharashtra State. Inter-State and Intra-State costs of education differ considerably, which causes variations in standards of education. These evidences reinforce the need for evolving methods for equitable basis of funding universities.

8. Salary and Non-Salary Expenditure

Of the direct expenditure on the universities, a large proportion i.e., about 60 per cent, is accounted for by the salaries of teaching and non-teaching staff and the remaining 40 per cent is spent on equipment and consumable items, library, sports services, general maintenance, etc. The trend in growth of expenditure shows that the proportion of expenditure on non-salary support services is declining, indicating thereby, inadequate financial provision for physical facilities.

The rising share of expenditure on salaries is attributable to the defined structure of scales of pay and indexation of salaries with the rise in prices. There is, however, no such provision in regard to expenditure on support services. It follows that teaching and research support services are deteriorating, which partly explains the reason for degradation in quality of higher education.

9. Deficiency in Allocation Mechanism

The methods by which resources are allocated across the universities also need to be rationalised. The prevailing method of distribution of funds among different universities is not linked with requirements on account of teaching-load and inputs for research. As a result, considerable disparities occur in the provisions for infrastructural facilities for teaching and research among the universities. The universities, which are fully funded by the UGC appear to be relatively better off than those financed by the States.

The Central Government provides, through UGC, plan assistance on matching basis to the State universities. This approach has, however, not yielded desirable results because the fiscal capacity of the Centre and the States differs widely and most of the States, especially the backward ones, find it difficult to finance higher education programmes in which the grants extended to them by the UGC could be availed of by providing the matching share, which is usually larger than UGC's contribution. Again, the assistance from UGC is available only for a fixed plan period of five years. Thereafter, the State Governments have to take over the entire responsibility of financing these programmes under non-plan activities. In quite a few cases the States may not be in a position to take over the financial responsibility after the cessation of UGC's assistance and, therefore, the State's share is not made available in which case neither UGC's assistance is utilized nor educational programme is undertaken.

These factors obviously impede the efforts of the State universities and colleges to enhance the relevance and effectiveness of higher education.

The UGC relies on the assessment reports of the Visiting Committees which are constituted once in five years or so, and accordingly funds are earmarked for each university under its purview. By and large, such committees take their decisions on the basis of past trends and the assessment of the plan requirements in respect of each university. There is seemingly no uniform yardstick to determine the magnitude of plan and non-plan expenditure of the UGC financed universities, yet their funding on the whole is more satisfactory than that of the State universities whose financial requirements are provided in accordance with the grant-in-aid codes as evolved by each State. The grant-in-aid codes not only vary widely across the states but also are inelastic and imprecise. As a result, financial allocations for the State universities have not been commensurate with their genuine requirements.

Policy Implications

The inferences that emerge from the foregoing discussion are as follows :

- Since education is included in the Concurrent List of the Constitution of India, the UGC/the Centre ought to pay due attention to the development of higher education so that the national requirements for highly trained, skilled and specialized manpower are met as the same is a pre-requisite for expediting the process of development. This calls for evolving a uniform and sound basis for allocating resources for all the universities in the country so as to strengthen the institutions of higher learning. After all, higher education is such a crucial area of development which cannot be left to the whims and caprices of the economically weaker States and other agencies of socio-economic development and change, which lack sound perspectives on economic, social and cultural transformation of the country. More importantly, the co-sponsorship or co-financing of plan projects by the UGC and the States has not been a very successful venture in the past even though in the federal set-up partnership is viewed as a sound approach in all spheres of development. This, therefore, suggests that, without affecting the basic quasi-federal set-up, the Centre must play a dominant role in providing direction and setting the tone of development

of higher education by making substantial investments, which should be given on 100 per cent basis rather than on a matching basis. Such financial arrangements should, however, be consistent with the academic, administrative and financial autonomy of the universities as well as the corresponding accountability to the society.

(b) As the resources are always limited, it is imperative to finance higher educational plans on the basis of manpower requirements. In view of the existence of a large number of non-viable colleges, signifying less than desirable enrolment and infrastructure facilities, on the one hand and the growing number of graduate unemployables and mismatch between degrees and jobs on the other, the manpower planning approach to finance higher education is surely the solution to the problem. The question which looms large, however, is that whether we have the desired political will to rationalise and harmonize our policies and practices such that the distortions in the higher education system are minimised.

(c) Since plan programmes are undertaken on the basis of their contemporary relevance as well as desirability for future, there should be every attempt to ensure that such programmes are not jeopardised for the reasons of non-availability of resources. As discussed earlier, by and large, plan projects of the State universities are financed by both the UGC and the States on matching basis and the latter find it difficult to provide for their shares. As a consequence, plan projects are either not undertaken or not fully implemented. This hampers the efforts to launch socially and economically relevant programmes in universities. Also, it leaves much to be desired on account of financial accountability of the programmes. The solution lies in identifying programmes of national importance in higher education, which may be eligible for 100% funding from the Central agencies like the UGC, ICAR, etc. The States should not object to such moves since financial liability even on non-plan account of such programmes of national importance would be the responsibility of these organisations alone. This is important more so because due to shortfalls in the availability of resources, a number of universities are compelled to keep some of the development activities in abeyance till the money is made avail-

able to them. They are also forced to keep certain staff positions vacant much to the detriment of the quality of higher education. Obviously, there is imperative need to avoid such practices by allocating adequate resources through the Central organisations which have been specifically entrusted with the responsibility of financing programmes of development of higher education. A sound approach to rectify the deficiencies in the mechanism of allocation of resources is called for to minimise the disparity in availability of resources for comparable courses of studies as well as to ensure adequacy of funds for meeting the quantitative and qualitative needs of higher education and research. This would, however, necessitate physical and financial planning of educational programmes and effective coordination of planned activities at different governmental levels, because the perpetual deficits in most of the university budgets is surely an indication of the lack of financial planning and administration among the universities.

(d) The internal revenues of universities especially from sources like tuition, lab and hostel fees and other user's charges are declining and the financial dependence of universities on Government has increased considerably. Such a development is not consistent with the accepted principles of public finance of equity and efficiency in allocation of resources among various competing investment demands for the following reasons :

First, there is no denying the fact that the financial dependence and the autonomy of universities are inversely related. The increased level of public funds have eroded due to external interferences the academic and financial autonomy of universities and the growing politicization of university campuses has adversely affected the administration and normal functioning of most of the universities. The Governments as well as various political parties have developed some vested interest with an eye on political gains of different kinds which are well known. All this has considerable dampening effects on such significant aspects as ensuring of accountability of universities in general and teachers in particular to the society. The resources invested on universities therefore, do not yield efficient results.

Second, the fact that a majority of those who benefit from tertiary education are drawn from relatively higher income groups and more than four-fifths

of funding by the Governments amounts to transferring resources from poor to rich since about 80 per cent of Government revenues are collected through indirect taxes, the incidence of which largely falls on people of low income groups. The prevailing method of funding higher education is regressive and does not conform to equity criterion of resource allocation. It, therefore, calls for evolving an approach whereby the beneficiaries of higher education are made to pay for the educational services. In essence, it requires upward revision of tuition, lab and hostel fees and other user's charges and effective collection thereof, to ensure equitable treatment of those who are within or outside the education system. The efficiency in allocation of resources and accountability of the system would get enhanced since those who would pay, would also demand for quantitatively and qualitatively better teaching and research services. There is similarly the case for mobilizing funds from the business and industry, which are beneficiaries of university outputs, by way of offering relevant courses and conducting training programmes as well as undertaking consultancy

research projects. The impact of all these would be that the lack of effectiveness in financial planning and management emanating mainly from perpetual deficits in university budgets could be rectified to some extent. Moreover, the financial dependence of universities on Government could be reduced which would minimise external interference in the functioning of universities. Without mobilization of adequate resources from the internal sources like tuition fees and other non-traditional sources such as business and industry, the financial health of universities is not likely improve since the competing claims of priority programmes like alleviation of widespread poverty and eradication of illiteracy on the public funds are very high. The institutions of higher education being chiefly responsible for preservation, dissemination and creation of knowledge, ought to invent and devise their own methods of mobilization of adequate resources and satisfy the equity and efficiency criteria of resource use so that they can fulfil their laudable objectives by way of making optimum contribution to national development. □

NOW IN THE
EASTERN ECONOMY
EDITION

The recent edition of
MORRISON & BOYD'S

Organic Chemistry along with its Study Guide

Eastern
Economy
Editions

... to make easier the understanding of Organic Chemistry... of how the chemical behaviour of molecules is determined by their molecular structure.

ORGANIC CHEMISTRY, 5th ed.,

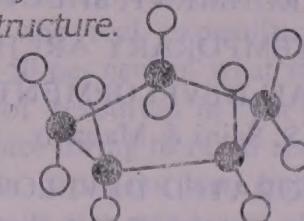
Morrison & Boyd

This widely-used text now includes

* topics of growing importance * study of the molecular structure in a new perspective
* complete chapter on 'symporia' * in-depth coverage of CMR and NMR
spectroscopy * over 150 illustrations of molecular models

1520 pages

17.8 x 23.5 cm



Rs. 125.00

STUDY GUIDE

The study guide not only provides solutions to all the problems given in MORRISON & BOYD'S text but gives step-by-step systematic explanations to strengthen the students conceptual understanding.

812 pages

21.6 x 27.8 cm

Rs. 95.00

Prentice-Hall of India Private Limited

M-97, Connaught Circus, New Delhi-110001 Phone : 3321779 (3 lines)



School of Planning and Architecture

(Deemed to be a University)

4, Block-B, Indraprastha Estate, New Delhi-110 002.

The School of Planning and Architecture had a modest beginning in 1941 as a Department of Architecture of Delhi Polytechnic. It was later affiliated to the University of Delhi and integrated with the School of Town and Country Planning, which was established in 1955 by the Government of India to provide facilities for training in Rural, Urban and Regional Planning. Recognising the specialised nature of the fields in which the School had attained eminence, the Government of India, through the Ministry of Education and Culture conferred on the School of Planning and Architecture the status of a Deemed to be a University. This new status enabled the School to broaden its horizon by introducing new academic and extension programmes, promote research and award its own undergraduate and doctoral degrees. The School offers courses in Architecture, Urban Design, Architectural Conservation, Urban and Regional Planning, Housing, Transport Planning, Landscape Architecture and Building Engineering and Management, some of which are offered by no other institution in the country. As an extension of its various programmes related to human settlements the School has also established Centres for Rural Development and Environmental Studies.

LIST OF PUBLICATIONS

1. 'SPACE' JOURNAL. Quarterly Journal of the School Annual Subscription :	Rs. 130.00 (Inland)
*2. HOUSING AND COMMUNITY IN OLD DELHI By H.R. TRIVEDI Published for the School By Atma Ram & Sons, Booksellers, Kashmere Gate, Delhi-110006.	Rs. 55.00
*3. CYCLONES & BUILDING BEHAVIOUR By S.K. NARAYANA Published for the School by M/s. Badua Press, R-9, Inderpuri, New Delhi-110012.	Rs. 80.00
4. ENVIRONMENT, SHELTER & NETWORKS edited by K.B. Suri	Rs. 80.00
5. CONTEMPORARY ARCHITECTURE OF DELHI edited By P.A. Dasai et al.	Rs. 26.00
6. URBAN DEVELOPMENT PLANNING STRATEGIES & TECHNIQUES By N.S. Saini & Mahavir	Rs. 30.00
7. INTEGRATED DEVELOPMENT PLANNING FOR A WATERSHED By N.S. Saini & R.L.P. Sinha	Rs. 150.00
8. JANTAR (A Souvenir Publication)	Rs. 10.00
9. URBAN & REGIONAL PLANNING INFORMATION SYSTEMS FOR INDIA/OTHER ESCAP COUNTRIES edited By N.S. Saini	Rs. 400.00

*Copies of Item No. 2 & 3 may kindly be ordered directly from the publishers.

For other Publications Please Write to :

Documentation-cum-Publication Officer

SCHOOL OF PLANNING AND ARCHITECTURE

I.P. Estate, New Delhi-110002

*Trade Discoun offered

Wanted : A More Meaningful Government-Varsity Partnership

K.K. Balachander*

In her eagerness to overcome centuries of neglect of human resources during the colonial rule and to avoid shortages of trained manpower in the course of industrialisation, India, after Independence, launched into a 'crash' programme to expand the higher educational system, especially the professional/technical category. Besides, the transformation of its 'elite' higher educational system into that of a 'mass' one, so that a vast segment of the population in the rising college-university age-group could be benefited, was a pre-Independence promise made by the political leaders. Once the aspirations of the youth were kindled, the movement of the higher educational sector could only be in one direction-upwards. The Government found it very difficult to resist the pressure for expansion. Increasing urbanisation further swelled the ranks of degree seekers ; and a n academic degree became necessary for most jobs.

During the last over four decades, a vast network of higher educational institutions has been established in the country. The number of universities (and university level institutions) and colleges has increased from 17 and 636 to more than 180 and 6500 respectively between 1947-48 and the present. Enrolment in the same period increased from 2,40,000 to 40,00,000, and it is growing currently at about 7 per cent per annum. Nearly 2.5 lakh teachers are engaged in the system. India has now the *third* largest higher educational network in the world. Enrolment in Indian higher education accounts for about 43 per cent of the total enrolment in the developing countries. Every eighth student enrolled in higher education on the globe is an Indian. A heroic achievement indeed !

I

A Sad State of Affairs

The increase in facilities for higher education after Independence has predominantly been with governmental support (i.e. Central and State grants). The bulk of the higher educational expenditure is however incurred by the States. The 'state' univer-

sities and their affiliated/constituent colleges, which form an important part of the higher educational system and covering nearly 95 per cent of the total enrolment, are *maintained* by the state government concerned. The University Grants Commission looks after the 'developmental' needs (Plan-period) of these institutions (mostly on a 'matching' basis by the State Government). As far as 'Central' universities are concerned, their maintenance as well as developmental needs are looked after by the Commission.

Though there has been a significant rise in government funds flowing to the higher education system, it has not however been in tune with rapid expansion and inflationary trends. The acceptance of the philosophy of unrestricted admission, irrespective of merit, has meant spreading available resources more and more thinly over a larger number and wider area. The share of contributions by way of fees, donations, etc. has also dwindled over the years. Although the 'per pupil' expenditure at 'current' prices has increased $2\frac{1}{2}$ times during the last three decades, the naked truth is that it has remained quite below the rate that would have been necessary to offset inflation. As far as the professional category of higher education is concerned, the situation is even more serious, the real expenditure per pupil having dropped to 50 per cent of what it was in 1950-51. The dilution of resources in 'per pupil' terms, which has taken place owing to rapid rise in numbers and escalating costs, could not have but caused definite erosion in academic standards. Several gaps have appeared in the physical facilities provided resulting in overcrowded classrooms, and ill-equipped laboratories and libraries.

Over the past few years, higher education in India is confronted with grave financial problems and this has been causing concern amongst all those who are interested in its welfare. Having created such a big system, almost totally dependent on government funds, the Centre, States and the UGC cannot eschew the responsibility of the financial consequences which are likely to result from this policy. The State Governments have also abetted in the mushrooming growth of universities and colleges, most of them hastily conceived, improperly planned, and

*Secretary-Technical Coordinator, Department of Economics, University of Bombay, Bombay-400098.

meagerly staffed and equipped. There is no justification in denying adequate grants to institutions that have already been permitted to come into existence.

Finance is the most crucial factor in the development of higher education ; many good reforms suggested by various Commissions and Committees have floundered due to lack/inadequacy of it. As the *Challenge of Education* has rightly observed : "Neither qualitative nor quantitative improvements can be effected without provision of resources. In fact, the resource implications of qualitative changes in education would be far greater than that of mere quantitative expansion because in such an initiative additional per unit requirements for quality upgradation will be needed for new as well as the existing institutions". (p. 62). It appears that there has been no proper realisation of the real nature and role of higher education—especially of universities where teaching and research are combined. In spite of many hurdles created, it is heartening to know that some university departments have responded to the challenges of excellence but they are far too few.

Grant-in-Aid Policy

One of the most important pre-requisites for the efficient functioning of the higher education system and making it an effective instrument of Socio-economic progress is the devising of an adequate grant-in-aid code for higher education. The procedures and practices evolved by Central/State Governments, UGC, etc. for this purpose do exert a decisive influence on the academic health of the institutions. This is more so because the contributions from private sources are fast drying up and the universities/colleges have no other alternative but to look to the Government and its agencies for financial sustenance.

A well-conceived policy of development of higher education is lacking under the existing system of grant-in-aid for universities and colleges in the country. The main thrust of conditions of state grants is on administrative and financial aspects rather than achievement of academic excellence in institutions. *As a consequence, the emphasis appears to be more on 'regulation' than on 'development'.* The conditions for the award of grants are becoming more stringent and the academics are told every time of the necessity for cuts in expenditure. The universities, especially the older and larger ones, are caught in the middle trying to keep themselves afloat in the

turbulent sea of tighter budgets, mounting criticism and declining confidence. In many States, the universities, for all practical purposes, have become an appendage of the department of education with the state officials—most of whom lacking expertise in education and are generally not competent enough to understand real academic need—having almost complete sway over their day-to-day administration and even over academic matters such as workload of teachers, the distribution of work between post-graduate and undergraduate teaching and between classroom instruction and research, laboratory work, field work, etc. A study of the University Acts passed in some States would reveal that there is greater governmental interest and involvement in university affairs in recent years.

In short, there is a total lack of appreciation of the real role of universities and all that is sacred in the realm of higher education. The universities (and their colleges) are forced to fit themselves into the straitjacket tailored by the State Governments. The fact that this affects the hopes and aspiration of thousands of students and a good number of teachers in the system is totally forgotten in the process. There have been long delays in making quite obvious decisions, resulting in needless compounding of the problems and creating new problems. Some State Governments are reluctant to pay even their small (matching) share in the allocations made for the universities/colleges by the UGC, based on recommendations by its Experts Visiting Committees. Parikh has observed in this context :

"Difficulties (with regard to development programmes of state universities) have arisen because of the attitude of state governments.....The reasons can be of two types, academic and financial. The government often does not have the machinery to evaluate a scheme in the context of a properly coordinated programme of university development in the state as a whole. It may therefore be influenced by *ad hoc* considerations, if not by altogether irrelevant ones, or be willing to accept that whatever has been sanctioned by the University Grants Commission is sound for it. The actual adoption of one or the other of these approaches is largely influenced by considerations of available funds. Paucity of funds sometimes induces the government to begin coordinating developmental programmes arbitrarily on the basis of *ad hoc* advice and creates needless discontent. Sometimes it leads to an equally arbitrary refusal to share expenditure".

Besides many state governments (and that includes some economically advanced ones too) have been dodging their responsibility of financing, on a continuing basis, the academic programmes initiated by the UGC in the preceding Plan in state universities. As a result, these are either totally discontinued, or continued on a truncated basis, after the Commission's cent-per-cent assistance has ceased. It has generally been the experience that many state governments do not welcome such financial burden placed on them by the Commission. The Education Commission has cited several examples of this kind. (At the same time, such UGC sponsored Schemes in central universities need not experience this kind of uncertainty as their financial needs are well looked after by the UGC on a permanent basis).

There is no disputing against the above background of the urgent need for a thorough change of the present framework for the flow of grants to universities and colleges. Also the existing Acts framed for state universities have become outdated in many respects and need to be amended suitably to reflect more recent developments and the changed situation. Another crucial reform that is needed is that those who are involved with decision-making in State Education Ministries should primarily be persons with some expertise and commitment to the cause of education and not non-professional bureaucrats. The Government of India may think in terms of reviving the All-India Specialised Service Cadre in the case of Education—the Indian Education Service. The recent crisis in the higher education system (and the Teachers' strike) has, in fact, reinforced the need for it. The present situation also calls for firm answers to such questions as whether the future expansion of university education should be determined by the market situation or by analyses of national need, or a combination of both, and how these could be forecast and fed into the policy decisions made.

II

UGC and State Universities

Any discussion on the financing of universities/colleges would remain incomplete without reference to the role of the University Grants Commission which has been in existence for quite some years. In the 66th Report of the Estimates Committee (laid in the Parliament on March 30, 1989), the performance of the Commission and the Ministry of Human Resources Development (Department of Education) has

come in for some criticism. The Committee has particularly castigated the UGC for the strange pattern of *uneven* allocation of grants between 'central' and 'state' universities on the one hand, and between colleges in Delhi and colleges outside Delhi, on the other. The differential treatment meted out to these two types of institutions had been critically commented upon earlier too by the Comptroller and Auditor General of India, the Public Accounts Committee and the Review Committee on the UGC.

The central universities (and their colleges) form only a small part of the entire university system, both institutionwise and enrolmentwise, but they receive grants from the Commission on a generous scale. This is evident from the wide disparity in the 'per pupil' maintenance grant as between these universities (and their colleges) and state universities (and their colleges). A major proportion of the UGC's Plan grants too are skimmed off by the 8 central universities leaving very little for over 130 state universities.

Chaotic Situation

Many state universities—especially the older, larger and reputed ones—are reeling under severe financial strains but they have to be content with a much smaller share of government funds as compared to central universities. They are saddled with huge budget deficits and many of them are frantically taking recourse to borrowing/overdrafts from banks to meet their current expenditure, the interest on which alone amounts to lakhs of rupees. The grants given by the state governments are inadequate, and have no relationship either with rising enrolment or other economic indicators. The chronic financial crisis of the state universities has further got aggravated by the 'Salary Payment Scheme' recently introduced in some States to replace the earlier assorted type of grants given. Adoption of this new system, at least in the case of old, large universities, has meant that they have to shoulder the entire financial burden in respect of the large 'non-salary' expenditure. Generation of this much additional income by these universities is well-nigh impossible. As a consequence, they are forced to cut down drastically expenditure on many ongoing programmes of high academic value as well as on libraries, laboratories and related infrastructural facilities. If the current situation is so chaotic, it is anybody's guess as to what can foreseeably happen in the not-too-distant future !

The status and eminence surrounding many of the

older, larger universities are wearing thin due to their hand-to-mouth existence. It is also clear that the grants from the UGC do not flow to these institutions on the basis of the grants that they receive from the state governments or their financial position and needs. The adequacy or inadequacy of state grants has not been taken into consideration by the Commission while determining its own grants to state universities. The division of financial responsibility between the Commission and the state governments does not seem to be rational. Also the existing norms for financial assistance to state universities/colleges by the UGC appear to have been fixed long back when the needs of these institutions were limited and the purchasing power of the rupee was much more than its existing worth. The state universities (and their colleges) also find it difficult to augment their incomes by even a small increase in rates of tuition and other fees which are at present very low and fixed decades ago. The rates of student fees are again regulated by the State Education Departments and they would not like the institutions to meet their rising costs through higher fees. In the earlier period of university education, munificent private donors did take active interest and initiative—in fact they took great pride—in the founding of universities/colleges, and they financed them liberally, but this trend too disappeared before gathering any momentum. Also, with the proliferation of many new universities at a rapid pace in the states, most of them established on extra-academic considerations, the older ones have found their resources getting depleted—the establishment of each university has been a step in the direction of starving the existing ones of public funds. Besides, the setting up of separate research and other specialised trend-setting institutions, financed by central/state governments, has meant depriving universities, which cater to the people at large, of a good deal of financial and special support particularly for research.

In short, measures to rescue universities from financial crisis have been gaining more importance in recent years than real academic activities in many states. Unfortunately, neither the Human Resource Development (HRD) Ministry nor the UGC at the Centre, has any intimate awareness of the crisis that is fast engulfing many state universities (and their colleges) and the problems and agonies of the personnel working in these institutions. Perhaps the UGC is mostly bogged down with the problems of central universities (and their colleges) and have no time for state universities although a larger propor-

tion of the enrolment in higher education vis-a-vis central universities, is located in these institutions. These institutions, particularly the older and larger ones, certainly deserve larger maintenance and developmental grants.

III

The Need of the Hour

The intention of Entry 66 of the Union List of the Seventh Schedule of the Constitution of India as well as placing 'Education' under the 'Concurrent List', insofar as it is related to university education, was to regard *all* universities as 'national institutions' irrespective of the source of their creation. Why is it that the HRD Ministry/UGC is still treating the state universities as just local entities and not as an integral part of the national university system? It may be mentioned here that while advocating the concept of a University Grants Committee for Indian universities on the pattern of the British UGC, the Sargent Report (1944) had felt that the financial implications of educational reorganisation ultimately make it desirable that the Central Government should relieve provincial governments to a large extent of the financial responsibility for university education. This implied, according to Joshi, that provision should be made for both 'maintenance' and 'development' grants to state universities and colleges by the Central Government as in the case of central universities. The Radhakrishnan Commission on University Education (1948) too had stated that the UGC was responsible for ALL Indian universities for development and maintenance assistance. "The question of special consideration of central universities and their colleges as against state universities and their colleges was never in the mind of the framers of the Sargent and Radhakrishnan Reports. The separate kind of treatment for central universities by the Indian UGC was a result of the provision for it in the UGC Act of 1956". (K.L. Joshi). The Education Commission—appointed in 1964 under the Chairmanship of Dr. D.S. Kothari who was himself the Chairman of the UGC then—also had observed that a body like the UGC should periodically assess the financial needs of state universities, say for a period of 3-5 years, and this should form the basis for providing grants to them. It had also recommended that all efforts be made to place the finances of these universities on a sound footing, and that the UGC itself should be enabled to give both developmental and maintenance grants to them. It had also desired that a suitable policy be framed to help

maintaining university autonomy. It is very sad that the recommendations of the Kothari Commission as well as those made by other two committees set up later on (the Committee on Governance of Universities and Colleges and the Review Committee on the UGC) with regard to the reforms urgently needed in the funding of state universities have not yet been implemented.

The time has now come for the Centre/UGC to understand the financial problems of state universities and evolve a basis which, as far as possible, dilutes the glaring disparities between them and central universities in the allocation of maintenance and development grants. The UGC policy so far has appeared to be non-interventionistic in state policy which though desirable in general, is, in some cases, proving to be antithetical to the development of an egalitarian and sound university system in the country. Instead of looking upon the maintenance of state universities as just the respective state government's concern, the UGC as the apex national body on university education, should extend more assistance, either directly or indirectly, to alleviate the financial difficulties faced by them and thus prevent the steep fall in academic standards. The Government of India should place at the Commission's disposal sufficient funds to enable it to extend cent-per-cent assistance, permanently, for some select programmes of state universities which are important from the national point of view. Such a step would end the uncertainties and enable these institutions to devote themselves fully to the pursuit of excellence. Also if the UGC could become more professional in character—similar to the Medical Council of India—it would help smoothen matters a lot and enable it to play an active role in the development of university education in the country.

Centre's Role

In many countries with a federal set-up and with a strong tradition of local control on university education, even in the absence of any constitutional obligations for that purpose, there is a growing realisation of the need for a substantial increase in federal (central) assistance to this vital sector. In India too, the Centre's role now has become more important particularly in the context of achieving many of the objectives set out in the New Education Policy (1986). The Centre's commitment to university education should be adequately reflected by its role not only for broad formulation of education policies, programmes and throwing up of new ideas,

but also by commensurate financial support for implementation of these policies, but this has not been the case so far. In fact, as Sharma states, there has been a successive squeeze in federal funds in recent years! This is surprising particularly after 'Education' has been brought under the Concurrent List and the National Policy on Education (1986) itself has made a plea for a new and meaningful partnership in financing education between the Centre and the States. Given the superior resource position of the former, it must accept more responsibility to share the increasing cost.

State Councils

At present the sources of decision-making and funding, as far as state universities (and their colleges) are concerned, are found in a loose series of interrelationships among the Union Ministry of Human Resource Development, the Planning Commission and the University Grants Commission at the Centre and the Ministries of Education and Finance in the States. The most exasperating part of the entire situation is that there is a pronounced lack of coordination between these agencies. The procedures of grants-in-aid differ from one agency to the other; also there has been a lot of over-lapping in their functions.

It is desirable, therefore, to have a state-level body, or Council, which can serve as a buffer, or channel of communication, between the state government and the UGC on the one hand, and between these agencies and the institutions (and faculty), on the other. While the importance of the autonomy of universities and their right to freedom to experiment and innovate cannot be over emphasized, it is being increasingly realised that there has to be a coordinating mechanism to reconcile such freedom with accountability to the students and the community. In fact, one of the important recommendations of the recent NPE was the setting up of a council in each state to deal with the problems of higher education, but so far it has failed to get off the ground. As and when the Council is set up, it would be good if two or three independent educationists and economic experts are associated with it, besides others. The choice of members to serve on the Council is very crucial. The duties and obligations of the Council should be clearly defined; it should be free from the different pulls which dominate the higher education scene today.

The Council could assess periodically, say every

three years, the financial needs of universities and their colleges, determine the quantum of grants from various agencies and ensure its timely flow. It could also advise the state government and the institutions on enrolment policy, provision of adequate infrastructural facilities, fixation of fee rates for different courses and measures to augment additional non-governmental resources. It could help in preparing perspective plans for the overall development of higher education in the state under the broad guidelines laid down by the UGC, and ensure that the development programmes already initiated during the earlier Plan-period are continued without any hindrance. It could also see to it that higher educational perspectives, from a national and international angle, get proper weightage at the state-level, that rules are used as an aid and not as an obstacle to research and development, experiment and innovation and that the vast administrative machinery in the universities becomes an instrument of progress, rather than halting it. All these steps will smoothen matters at the state level and improve the effectiveness of the system which is the dire need of the hour. The UGC itself can discharge its function more effectively with the help of the State Councils rather than through direct dealings with universities/colleges. In this context, the following remarks of the Kothari Commission are noteworthy:

"It is not desirable that the Government should deal directly with the universities. It is always a great advantage to interpose, between the Government and the universities, a committee of persons selected for their knowledge and standing rather than for their political application or official status. Such a device ensures the necessary coordination between Government and universities, allocates Government grants to institutions of higher education on the basis of carefully assessed needs and yet insulates them from inappropriate political influences".

IV

The Challenge Ahead : Promoting Excellence

The expenditure per pupil is bound to be high in the case of higher education, postgraduate and professional education in particular which demand a higher level of infrastructure and fairly well-qualified staff. Without adequate financial support, far more than currently provided, there can be no progress in higher education, except marginally here and there. If the universities were 'private' institutions, they

could be sustained through higher tuition fees covering the cost—as is happening in the case of many private schools (and private universities in the U.S.A)—but it is impossible to expect this in India. Even if more financial support could be mobilised through fees and private philanthropy, it can never be a substitute for government support; it can only be a corrective or balancing element. With the fast expansion of higher education, universities everywhere in the world are increasingly coming to depend on the Government and this situation cannot be changed. If the universities are neglected and damaged, India will have to face darkness in the 21st century. It is high time that some determined action is taken to put the system back on the rails so that it moves smoothly towards its destination. *And for this there has to be a clear and implementable understanding between the Central Government the UGC and the State Governments with regard to funding of universities (and their colleges).* In the interest of the community, the relations between these funding agencies and the universities have to be rational and harmonious.

Conclusion

Having said this, one may ask a question which may be unpleasant. Has the academic community ever evinced a keen interest in the basic problems facing the state universities and has it confronted the Government with some positive solutions ? Has it made a sincere attempt to understand the gravity of the financial crisis fast engulfing the universities and the resultant deteriorating standards of higher education ? Has it ever attempted to define precisely and unambiguously in operative terms the real goals of university education ? Perhaps it is because of their indifference or the usual '*chalta hai*' attitude that government bureaucrats and political activists wish to fill the vacuum and impose their decisions and a variety of controls on the institutions. The academic community perhaps does not realise that there is an inherent danger in leaving too many problems to the government and 'non-academic' people elsewhere for solution. While complaining about greater governmental interest and involvement in their affairs very few have cared to ask how such a situation has come about ! Mere sermons to Government asking it to keep off the Campus will not help. The teaching community should do some real soul searching and assess in a dispassionate manner, their contribution from the point of view of enhancing the quality of academic life and keeping the universities in good health, especially when their demands for public

funds are multiplying. Barring a few exceptions, the Indian Universities (and their faculty) have shown little inclination to bring about the needed transformation/modernization in the teaching-learning process in the light of the fast changing needs of the society. At a time when knowledge is increasing at a rapid and accelerating pace, the faculty have got themselves stuck with outdated and outworn curricula and course-contents. The Academic Councils and Boards of studies have, by and large, shown a strong resistance to break with the past.

There is already a general discontent with the system of higher education. In spite of the massive investment made on it, it is said, universities in general are not just delivering the goods; at the same time, some are lavish and squander resources, for purposes not academic. Instead of being centres of 'academic excellence' many universities have become centres of 'academic mediocrity' negating the primary concept of university education. In this environment of disillusionment the average taxpayers may be inclined to question the very *value* of the services, such as teaching and research, provided by universities. The sooner universities/colleges, and their faculty, recognise the need for changing their perspective and style of functioning, and ending their isolation, the greater the chances of their being put on firm financial footing by the community.

Since the major needs of university education in this country are met by the public exchequer, it is difficult to avoid completely public scrutiny and accountability. The proposition that "the universities (and colleges) be left alone" may not find easy acceptance in the present context. They have to justify their claim on public grants in terms of achievements and excellence in teaching and research as well as commitment to the highest values of the society. A balance has to be struck, therefore, between the need for institutional autonomy and self-determination, on the one hand, and accountability to the public, on the other, so that both sides may be aware of their commitments and responsibilities. The Association of Indian Universities needs to be commended for initiating a debate on this vital issue. [The views expressed in the article are purely personal.] □

REFERENCES

1. Adisesbiab, Malcolm, S., (i) "Centre-State-University-College Partnership in Education", Paper presented at

- the *National Seminar on Higher Education and the Future*, University of Bombay, Dec. 20-22, 1983; and (ii) "University to be a University", *University News*, Vol. XXV, No. 50, Dec. 14, 1987 (Special Number).
2. Ahmed, Rais, "Universities-Perspectives and Problems" *Journal of Higher Education*, Vol. 7, No. 3, Spring 1982.
3. Altbach, Philip, G., *Higher Education in the Third World: Themes and Variations* (Chapters 10 and 11), Radiant Publishers, New Dehli, 1987.
4. Association of Indian Universities, *Presidential Address of Professor G. Rama Reddy* (Sixty Second Annual Meeting), *University News*, Vol. XXV, No. 52, Dec. 28, 1987.
5. Azad, J.L., (i) "The Financing of Higher Education in India" in Amrik Singh and Philip G Altbach (Ed.), *Higher Learning in India*, Vikas, 1974; (ii) "Educational Finance in India: Progress, Problems and Perspectives", *The Indian Journal of Public Administration*, Vol. XXXII, No. 3, July-Sept. 1986; (iii) "Resources for Higher Education", *University News*, Special Issue, Vol. XXV, No. 50, Dec. 14, 1987; (iv) *Government Support for Higher Education and Research*, NIEPA, New Delhi, 1984; and (v) *Higher Education in India: The Deepening Financial Crisis*, Radiant Publishers, 1988.
6. Balachander, K.K., (i) *Government Grants and Higher Educational Development—With Special Reference to Indian Experience Since Independence*. Ph.D. Thesis University of Bombay, Oct. 1984 (To be published); (ii) "Redeeming State Universities", *University News*, May 23, 1986; (iii) "Salvaging Higher Education": New Challenge", *Southern Economist*, Vol. 25, No. 6, July 15, 1986; (iv) "Government and Higher Education: Need for a Realistic Grant", *Economic Times*, Dec. 18, 1986; (v) *Funding of State Universities: Some Critical Issues* (Review Article), *University News*, Aug. 31, 1987; (vi) "Higher Education in India: Shifting Perspectives", *University News*, March 21, 28 and April 4, 1988 issues; (vii) "Higher Education—Need for a Detailed Strategy", *Mainstream*, June 4, 1988.
7. Bharadwaj, R and Balachander, K.K., "Higher Educational Planning and Administration: The Challenge of Change", *Journal of Education and Social Change*, Vol. II, No. 3 Oct-Dec. 1988.
8. Bhiday, M.R., *From Isolation to Mainstream: Higher Education in India*, Radiant Publishers, 1986.
9. Brahmananda, P.R., (i) "Current Higher Education Policy", *University News*, Aug. 1, 1984; (ii) "A Quasi-Empirical Approach to Higher Education". *National Seminar on Higher Education*, JNU, Nov. 14-15, 1985.
10. Carnegie Commission on Higher Education, *The Federal Role in Post-Secondary Education—Unfinished Business*, 1975-80. Jossey-Bass Publishers, Washington, 1975.
11. Chaturvedi, O.N., "University Objectives in a Changing World", *The Indian Journal of Public Administration*, Vol. XXXII, No 3 (Special No. on Education), July-Sept. 1986.
12. Dongerkery, S.R., *Universities and Their Problems*. Hind Kitabs Ltd., Bombay, 1948.
13. Gardner, John, W., *Excellence: Can We Be Equal and Excellent Too?* Vakils, Feffer and Simons, Ltd., Bombay, 1984.
14. Gawdino, Robert, L., *The Indian University*, Popular Prakashan, Bombay, 1965.

15. Gore, M.S., "Universities and the Government". *University News*. Jan. 16 and 23, 1986.

16. Gravbard, Stephen, R., and Ballotti (Ed.), *The Embattled University*, George Braziller, New York, 1970.

17. India, Government of, Ministry of Education (HRD). (i) *Education and Development: Report of the Education Commission*, New Delhi, 1966; (ii) *Report of the Review Committee on University Grants Commission*, New Delhi, Jan. 1977; and (iii) *Challenge of Education—A Policy Perspective*, Aug. 1985.

18. Jayaraman, T. R., "Higher Education and the State Governments" in Amrik Singh and Philips G. Altbach (Ed.), *Higher Learning in India*, Vikas, 1974.

19. Joshi, K L, (i) *Problems of Higher Education*, Popular Prakashan, Bombay, 1977; and (ii) "25-Years of UGC—Dilemmas and Difficulties", *Journal of Higher Education* Vol 6, No. 1-3, 1980-81.

20. Kurup, M.R. and Thatte, L.R., "Pricing of Higher Education : An Exploratory Sample Study", *Economic Times*, April 5, 1989.

21. Maharashtra, Government of, *Report of the Committee on the Finances of the Non-Agricultural Universities in the State of Maharashtra*, Pune, 1984

22. Majumdar, Tapas, "Finances of the Universities", Paper presented at the *National Seminar on Higher Education and the Future*. University of Bombay, Dec. 1983.

23. McMurrin, Sterling, M., *On the Meaning of the University*. University of Utah Press, Salt Lake University, 1976.

24. Nair, Ramachandra, K.R., *The Emerging Spectrum—Essays on Indian Higher Education*, Himalaya Pub. House, Bombay, 1986

25. Narain, Iqbal, "Power Structure in India's University System: Reflections of an Insider". *Indian Journal of Public Administration*, Vol XXXII, No. 3, (Special No. on Education), July—Sept. 1986.

26. Padmanabhan, C.B., "Role of Federal Finance in Education for All—Towards a More Meaningful Centre-State Financial Partnership in Indian Education" Paper presented at the *J P Naik National Seminar on Education For All*, IIE, Pune, Sept 20-22, 1986

27. Panchamukhi, P R., "Expansionism and Financial Crisis in Higher Education", and "Higher Educational Development in India : An Evaluation" in *Studies in Economics of Education and Fiscal Economics* Vol II 1974-77

28. (Unpublished), Department of Economics, University of Bombay, 1977 ; (ii) *Economics of University Finances : Basic Principles and Practice*, Centre for Multi-Disciplinary Research, Dharwar, 1977 ; and (iii) "Financing of University Education : Some Basic Issues", Paper read at the *National Seminar on Higher Education and the Future*, University of Bombay, Dec. 20-22, 1983.

29. Parikh, G.D., (i) "University Finance—Problems and Procedures" in Amrik Singh and Philip G. Altbach (Ed.) *Higher Learning in India*, Vikas, 1974 ; and (ii) *The Crisis in Higher Education*, Leslie Sawhney Programme, Bombay, 1972.

30. Rao, Navaneeth, "State Councils of Higher Education", *University News*, Vol. XXV, No. 52, Dec. 28, 1987.

31. Raza, Moonis, "Crisis in Higher Education in India", *Social Change*, Vol. 15, No. 3, Sept. 1985.

32. Reddy, Eswara, V., "Reforms in Higher Education in Retrospect", *Social Change*, Vol. 15, No. 4, Dec. 1985.

33. Satish Chandra, (i) "The University Grants Commission and Its Role : A Review", *Journal of Higher Education*, Vol 10, Nos. 1-2, Monsoon-Autumn, 1984 ; and (ii) "Higher Education in India—A Review and a Look Forward", *Mainstream*, March 23, 1985.

34. Shah, Madhuri, R., *Challenge to Higher Education in a Changing India*. 20th A.D. Shroff Memorial Lecture, Bombay, Oct. 1985.

35. Singh, Amrik, (i) The Indian University in the 80's and 90's in *Higher Education and Development*, AIU, New Delhi, 1975 ; (ii) The Foundation Role of UGC, *Journal of Higher Education*, Vol 7, No 1-2, Monsoon-Autumn, 1981 ; (iii) "Redeeming Higher Education", *Journal of Education and Social Change*, Vol I, No 1, June, 1987 ; and (iv) "Education Tangle : UGC Vs. States", *University News*, Vol. XXV, No. 52, Dec 28, 1987.

36. Singh, Amrik and Altbach, Philip, G. (Ed), *Higher Learning in India*, Vikas, 1974

37. Singh, Amrik and Sharma, G.D. (Ed.), *University and College Finances*, AIU, New Delhi, 1981.

38. Sharma, G.D., (i) Institutional Costs of University Education, AIU, New Delhi, 1980 ; and (ii) "Role of Federal Finance in Education For All", Paper presented at *J P. Naik National Seminar on Education For All*, IIE, Pune, Sept. 20-22, 1986.

39. University Grants Commission, *Report of the Committee on Governance of Universities and Colleges* UGC, 1971.

THE INDIAN JOURNAL OF SOCIAL WORK
 an interdisciplinary quarterly
 on Social Work and Social Sciences,
 Published by

**TATA INSTITUTE OF SOCIAL SCIENCES,
 DEONAR, BOMBAY-400 088**

Started in 1944, it is devoted to the scientific interpretation of social problems and the advancement of social research.

Countries

INDIA

SOUTH ASIAN COUNTRIES :

Bangla Desh, Bhutan, Burma, Nepal, Pakistan, Sri Lanka

SOUTH EAST ASIAN COUNTRIES,

THE MIDDLE EAST AND AFRICA

USA, CANADA, EUROPE

(All prices inclusive of mailing charges)

Subscription Rates

	<i>Annual</i>	<i>Per Copy</i>
	Rs. 75/-	Rs. 20/-
	\$ 10/-	\$ 3/-
	\$ 15/-	\$ 4/-
	\$ 20/-	\$ 6/-

Our Recent Publications

B.	No.	Title	Rs.	Ps.
B.	58	The Delinquent and the Education (Sanober Shckar—1987)	20	00
B.	59	Industrial Jurisprudence (V.G. Varghese—1987)	65	00
B.	60	Women and Rural Development in the Third World (Sarathi Acharya—1987)	30	00
B.	61	Missing Values : Alternatives in Data Analysis (P. Ramachandran—1987)	30	00

Resource Allocation and Financial Accountability of Universities

M.M. Ansari*

Budgetary resources are always limited while the investment needs of various priority areas of national concern like alleviation of nutritional and health poverty, elimination of rampant unemployment, eradication of illiteracy etc., are very high. In the regime of intense competing claims for funds by various sectors of development, financial requirements of different sub-sectors of education have generally been much higher for attaining such laudable objectives as universalisation of elementary education, promotion of adult and vocational education and improvement of quality and relevance of tertiary education. And to meet the required level of expenditure has been beyond the affordable capacity of the country due mainly to the low stage of its development.

The question of allocation of resources for university sector therefore, cannot be dealt with in isolation from the nature and extent of contribution of higher education to national development. This calls for an objective assessment of the factors that have significant bearing on the quality and relevance of higher education and research for social and economic progress. Therefore the development of performance indicators or efficiency norms for assessing the productivity of university system is a *sine qua non* for justifying the need for the prevailing level of funding and for ensuring its accountability to the society. This alone can minimise wasteful expenditure on universities since such an approach would assist in planning and management of resources. A thorough review of approaches to finance university education is, therefore, imperative to identify the factors which help and/or hamper the development of higher education and research.

There are different types of university level institutions, like Central universities, Deemed to be universities, Institutions of National Importance, State universities, etc. These are financed by different agencies of the Central and State Governments. As the treatment given to them by various funding agencies, namely, Departments of Education of the Central and State Governments, UGC, etc. differs, considera-

ble disparity in the availability of infrastructural facilities are caused even in respect of comparable programmes of studies. This impinges upon the efforts to raise and maintain a uniformly high standard of education across the universities. In view of the theoretical parity in the diplomas/degrees awarded by various universities, there is a *prima facie* case for adopting a unified scientific approach at the Central and the State levels to work out financial requirements of various courses of studies across the universities so that the variations in investments on similar and comparable educational programmes are minimised to bring about parity in standards of education.

As against the practice of providing block grants on deficit and/or incremental basis which does not assist in rectifying under-funding of universities for historical reasons, a sound approach to determine allocation of resources for universities would be to use scientific norms for the purposes of both preparation of budget estimates as well as for controlling and checking of wasteful expenditure. Separate norms pertaining to all types of expenditure such as : (a) wages and salaries of academic and non-academic staff; (b) books and stationaries; (c) administration and travel; (d) equipment and furniture; (e) repair of building and equipment; (f) sports and culture; (g) scholarships; and (h) capital expenditure, etc.; may be worked out for planning and development of higher education as well as efficient management of resources. In this context, it is important to lay down two different kinds of norms. Firstly, physical or material norms, which may be expressed in physical units; and secondly, financial and budgetary norms expressed in monetary terms. Physical norms would provide a basis for ensuring standardisation between different institutions and would thus ensure a uniform quality and satisfaction of requirements. As the physical norms represent standards of relatively constant value and are determined where possible on the basis of scientifically determined standards, they would not vary between regions and institutions. On the other hand, financial norms which represent the translation of physical norms into monetary terms, differ from region to region and reflect differences in prices, tariffs, etc.

* Joint Director (Research), Association of Indian Universities, New Delhi 110002.

On the basis of appropriate judgement, norms could be expressed as individual norms of expenditure or combined norms which group together a number of individual norms pertaining to different kinds of expenditures. For some purposes, a number of combined norms could be grouped together to show, for example, the total cost of maintaining a class room in an educational institution. Such an approach, would be most appropriate for planning and management of resources with a view to ensuring quantitative development of higher education.

Institutional Costs

An easy way of planning resources is that the entire institutional costs (coursewise/departmentwise) should be worked out and accordingly the national/regional average cost should be maintained in all the institutions of higher learning while taking into account student-loads and the nature and extent of research programmes. Under this approach the costs under different heads may be worked out as under :

Teaching Cost

Teaching cost can be estimated by multiplying the average salary of academic staff by the required number of teachers which may be estimated by using the acceptable teacher-pupil ratio for a course of study.

In order to work out the salary component of the academic staff, it is important to have some idea, on normative grounds, of the proportion of teaching cost to the total educational expenditure and the ratio of teacher to student. Keeping in view the nature and types of courses taught and the need for providing supporting facilities, the ratios of teaching cost to the total cost and teacher to student could be assumed in close approximation of 60:40 and 1:20 or so respectively. These ratios are consistent with the respective national averages. For calculating teaching cost, we take into account : (i) the existing ratios as worked out on the basis of actual date for different types of courses and departments/institutions, and (ii) the need for improvement in quality of teaching and research which should, be assessed on the basis of some quantitative indicators of such needs as well as sound judgement. It should thus be possible to estimate the teaching cost which generally constitute a major chunk of educational expenditure. The imperative need to apply this approach is obvious from the

following :

- (i) The empirical analyses have shown that of the total expenditure on higher education about 60 per cent is accounted for by the salaries and allowances of the teaching and non-teaching staff and the remaining 40 per cent is spent on teaching and research support services.
- (ii) The trend in change in composition of expenditure over the last three decades demonstrates that whereas the proportion of expenditure on infrastructural facilities is steadily declining, the share of salary component is rising which is attributable to indexation of salaries with the rise in prices.
- (iii) A decomposition analysis further reveal that of the total expenditure of salaries more than 50 per cent is due to non-teaching staff.

What has emerged from the above is that a major proportion of the expenditure on higher education is devoted to either non-academic purposes or such times of expenditure which do not have direct bearing on quantitative and qualitative aspects of higher education. The suggested approach would however assure reasonable amount of expenditure for teaching and research purposes which should be assigned a heavy weight in the scheme of budgeting for higher education.

Cost of Non-teaching Staff

The expenditure on account of salaries of supporting and administrative staff should be determined by multiplying the average salary per non-teaching staff member by their total number. The number of supporting and administrative staff should, however, be derived as a ratio of the total academic staff on the basis of both the existing ratio which encompasses relevant decisions in the past as well as sound judgement of needs of a department/an institution which undoubtedly takes into account the expected quality of output. In this context also, we must refer to the calculated ratio of the teaching to the non-teaching staff which comes out to be 1.4 for a large number of Central and the State universities in India. One

would argue that this ratio should be in reverse order, that is, at the most, for three to four academic staff there should be one or two supporting and secretarial staff since the main activities in the university sector is largely teaching and research. This, therefore, provides justification for curtailing the expenditure on account of non-teaching personnel in universities which has acquired undue proportion in the university budgets. The amount thus released could be ploughed back for investment on new courses or quality improvement programmes.

Educational Infrastructure

The expenditure on equipment, furniture, consumable items, etc., is estimated roughly in the range of 5 to 7 per cent of the total university expenditure. The time series analysis of data on expenditure on equipment, etc., for the universities reveals a declining trend in expenditure on such infrastructure as above. Moreover, a cross-section analysis of data for a sample of universities shows wide variation in expenditure on equipment, etc. The evidence, therefore, suggests that to upgrade the teaching and research infrastructure, it would be desirable to earmark at least 10 per cent of the total allocation to universities for equipment, consumable items, etc. This would of course vary across the institutions depending on the nature and extent of science and non-science based courses of study at graduate and post-graduate levels.

The declining trend in proportion of expenditure on infrastructure ought to be reversed for arresting deterioration in standard of university education which has largely been felt by the educationists and employers.

As the need for essential supporting services would vary from one course of study to other, it would be desirable to estimate the expenditure requirements in relation to students, teaching and research staff on the basis of the costs obtaining in various institutions for different courses. The costs for the best performing institutions should be treated as acceptable norm for application among other institutions. By the same token, it also implies that the departments/institutions which lack basic facilities should not be entrusted with the responsibility of teaching and research in a particular discipline lest the quality of output should be sacrificed. In essence, the financial requirements on account of various infrastructure

facilities should be determined in relation to teaching and research activities; which could be quantified and, where difficult, proxy indicators could be made use of.

Maintenance of Library

The cost of books and journals has been rising for different well known reasons, while the proportion of expenditure on maintenance of libraries has been declining. As against the observed share of 3 to 5 per cent on library maintenance, this proportion ought to be roughly doubled so as to enable the university libraries to acquire new reading materials and related infrastructure for improving library services.

Building Repairs

The maintenance and repair of university buildings have rarely been paid due attention either by the universities or the agencies which finance them. The general paucity of funds is said to be the sole reason for deterioration in physical standards of classrooms and laboratories. This is eroding the base of capital formation in the country as well as affecting the healthy environment for teaching and research. There is, therefore, an urgent need to check further degradation of university building. It may be pointed out here that some of the State Governments follow the capital cost approach for providing the building maintenance grants, whereas others follow the norms based on plinth area as recommended by the Central Public Works Departments (CPWD). As most of the university buildings built by various Trusts are very old, and at the time of their construction, the nominal cost was much lower than what would be now, the eligibility for maintenance grants is, accordingly, very low. The grants available on the basis of capital costs are invariably found to be inadequate for carrying out repair works since the costs of construction materials have been rising. There is, therefore, an urgent need to adhere to the plinth area approach of providing maintenance grants and applying the CPWD norms uniformly among all the universities. This view is consistent with the recommendations of earlier Finance Commissions. The implementation of this approach alone can maintain the capital values of past investments.

Measures for Resource Mobilisation

(i) Augmenting Tuition and Hostel Fees

The costs of higher education have been rising.

The personal benefits from education have also increased reflected from high demand for education as well as from the positive relationship between the wage structure of labour force with their levels of education. The rates of tuition fee for various courses are, however, stagnant as they have not been revised for several years. This has rendered the fee policy as a regressive form of taxation, since more than 80 per cent of the beneficiaries of higher education are drawn from the top 30 per cent of income groups. This calls for upward revision of tuition fee and linking it with the costs of education and incomes of parents so that the beneficiary groups are made to pay according to their ability to pay as well as the extent to which they benefit from educational programmes. Such an approach would surely put the university finances on a sound footing while pursuing the accepted principles of benefit and equity approach to finance social services. It is, therefore, suggested that tuition fee, especially in professional courses, should be revised. There would be no resentment from parents and students because employability of graduates having professional degrees is very high. Also, because higher education has considerable consumption and investment value for all types of courses. There is, therefore, sound justification for raising tuition fees in order to reduce the burden of subsidy.

A number of universities have been suffering from perpetual deficits on account of the maintenance of hostel facilities. In view of the fact that a majority of students who benefit from such facilities as well as higher education belong to economically better off section of the society, there is a strong case for upward revision of hostel fee and other related facilities. Hostels should be managed on a no-profit-no-loss basis, so that no deficit could occur in the non-plan account of hostel management. Likewise, other internal sources of income like examination fee, library fee, development charges, etc. ought to be tapped adequately.

(ii) Raising Resources from Industry

The measures for raising resources from external sources such as industries and other commercial concerns will reduce the present financial burden on the Central and the State Governments. With their own efforts, the universities should be able to augment much needed finances for supporting their educational programmes. Moreover, the institutions of higher learning would, at the same time, show a higher degree

of responsibility in catering to social and economic needs of people, as their success in this sphere will influence their efforts in mobilising funds from industries and philanthropists. The universities should suitably tap funds from industries and business houses by way of : (a) introducing such courses of studies and training programmes that would be relevant to needs of industries for raising their productivity; and (b) undertaking consultancy research projects, the findings of which might help in reorienting industrial activities as such that would improve not only their relative competitive position and earning prospects but also accelerate economic growth and enhance the quality of life of people.

(iii) Direct Funding : An Alternative Approach

Since recently an innovation has been made by the University Grants Commission and the Council of Scientific and Industrial Research for directly funding research degrees awarded by the universities. From the point of view of ensuring accountability of universities to the society, there is an imperative need to widen the scope of this approach and cover the students who seek to acquire university degrees. The reasons are asunder :

The prevailing system of financing universities by the Centre and the State Governments allows for the simultaneous existence of the best or worst performing university departments since the funds are provided on the basis of the past trends rather than the realistic requirements for planned programmes or the performance of universities as judged from their quality of teaching and research. As such there is no mechanism either at the Central or the State levels to ascertain the performance of a university vis-a-vis the average performance of other universities. Though there are differences in the levels of grants received by different universities in terms of per student costs—all of them continue to co-exist and make increasing claims on government funds and that without the expected improvement in quality of education. This is because there is no effective measure either to improve the quality of teaching by using the financial mechanism or to let the inefficient departments be routed out through the process of intense competition from the best performing institutions. Even though a large number of colleges are non-viable, a new university comes into existence almost every month. There is, therefore, hardly any effort to rationalize and justify the ever increasing expenditure on higher education.

To increase the returns from investments on higher

education, it is desirable to increase competitiveness among universities. The allocation of resources should be linked with the performance of university departments as judged from their : (a) quality of teaching and research; (b) volume of output i.e. teaching and research load, and (c) relevance of educational and research programmes to the contemporary needs of the society and economy. The objectives of universities can be realized by direct financing of planned number of students for various courses of studies in which case students would receive loans or grants from the Government and they would be responsible for making full payments towards the costs of education. This approach is, of course, in contrast to the existing practice of financing education through universities/institutions. The method by which various categories and levels of students should be fully or partly financed by parents, Government agencies, etc. require separate discussion. Some of the advantages of financing higher education through students are :

- (i) students would seek admission to the courses which they expect would ensure higher social and economic returns and would join such university departments that would provide the best education and training to them;
- (ii) students would compete for the limited government funds, in which case the students with proven capacity to learn would have the chance of receiving government support; and
- (iii) since the students would be responsible to pay for their education fully or partly, they and their parents would become more vocal and would be genuinely concerned about the quality and relevance of education offered by the universities;
- (iv) it would be possible to make obligatory, if required, for the beneficiary groups of students to serve for certain number of years, after completing the course work, on such priority areas as extension programmes pertaining to socio-economic development;
- (v) this would also effectively check brain-drain and minimise wastage of scarce resources invested on students pursuing professional degrees; and
- (vi) in the context of rural development also, it could be possible to ensure that the rural areas do not suffer for want of adequate educated and trained manpower since the out migration of educated persons towards cities

could be checked in the interests of balanced development of the country.

The UGC has already been following somewhat similar approach of direct financing of students for research degrees in various disciplines. Many teaching departments have come to realise about the low quality of teaching with them as their students cannot compete and qualify for research fellowships. Under the existing system of financing higher education through institutions, there is hardly any disincentive for the poor performance in teaching and research as the level of funding is hardly affected. As against this, financing of education through students would ensure : (a) a proper degree of competition across various teaching and research departments so as to attract adequate number of students in order to justify their existence; (b) enhance accountability of educational system to the society by way of improving the relevance of education and training programmes which is very much in demand in recent times; and (c) a reasonably high degree of responsibility on the part of students, parents, teachers, institutions and funding agencies for promoting the participatory role in strengthening the learning process for human resource development. The need of financing higher education through students arises also from the fact that of the total enrolment in higher education, only about 60 per cent pass out and of those who do so less than 25 per cent score above 50 per cent marks which in itself is indicative of low quality of education. Obviously, the existing method of funding through institutions yields less than optimum results which justifies the need for alternative policy approach. The ultimate objective should be to vitalize the university system to enhance its contribution to national development.

To sum up, it may be reiterated that the system of higher education cannot be improved unless financial inputs are provided commensurate with the requirements which could be worked out on the basis of scientific norms. The assessed requirements should be provided in such a manner that the quality of teaching and research is constantly improved since financial inadequacies or mismanagement of resources have the potentiality to play havoc with the university system to national development through generation and dissemination of specialized knowledge and skills. The National Policy on Education 1986 has rightly noted that higher education is a 'crucial factor for survival'. Hence, the need for vitalizing and strengthening the system of higher education in India by way of evolving an accountable method of resource allocation.

ALAGAPPA UNIVERSITY, KARAIKUDI

HIGHLIGHTS

1. Established in May 1985, the University was recognised by the University Grants Commission in December 1986.
2. This is the eleventh University in Tamil Nadu and of Unitary type which aims at developing itself into a research University ; its motto is "Excellence in Action".
3. The University has 11 full-fledged departments of teaching and research with 75 Faculty Members and 700 students at Post Graduate and Research level. It has a sprawling Campus of about 420 acres.
4. Full-time and Part-time research at M. Phil and Ph. D. level are offered in all disciplines. Summer Sequential M. Phil Programmes are also in progress.
5. Student's Stipendary Fellowships are awarded in each discipline for the pursuit of full-time Ph. D. Programme.
6. Socially relevant courses of study in advanced spheres of Science include a 3 year M.C.A. (Master of Computer Applications) and 2 year M.Sc. in Industrial Chemistry with specialisation in Electro Chemistry and Textile Chemistry.
7. Under the Distance-cum-Contact Programme, a Diploma Course is being offered in Computers and Applications Software.
8. The Centre for Women's Studies and Rural Technology established in 1987 has been recognised by U.G.C. as a Centre for Research in Women's Studies. It conducts research on identified (priority) areas and subjects which are crucial in the advancement of knowledge and expansion of the information base. The Centre offers M.A. Women's Studies and conducts TRYSEM courses in Screen Printing and Maintenance of Household Electrical Appliances for Girl drop-outs.
9. The new specialisations introduced during 1989-90 are M.Com. Entrepreneurship and M. Sc. Instrumentation.
10. A new Department of Bank Management has been started from the academic year 1989-90 offering M.B.M. and M. Phil. Bank Management Courses.
11. In tune with the major objectives of the University, National and Regional Seminar/Workshops in various disciplines are organised periodically.
12. The University proposes to start a two-year M. Tech in Electro-Chemical Science and Technology in collaboration with the Central Electro Chemical Research Institute (CECRI) Karaikudi and M.B.A. Programme with the approval of AICTE during the academic year 1989-90. Also plans to start Post-Graduate Programmes in Atmospheric Physics, Applied Mathematics, Educational Technology and M. Phil courses in Industrial Sports and Labour Welfare.
13. A school of Natural Sciences with Departments of Water Resource Management, Oceanography, Applied Geology and Geography and Remote Sensing is to be started during VIII Plan.

REGISTRAR

Restructuring Organisational Structure of Universities in India

Y.S. Kiranmayi*, G. Prasad* and K.V. Rao*

Organising is determining what resources and which activities are required to achieve the organisation's objectives, combining them into workable groups, assigning the responsibility for accomplishing them to responsible subordinates and then delegating to those individuals the authority necessary to carry out their assignments.¹ The behavioural scientists and the sociologists view organisation as comprising human relationships in group activity. It is referred to as the social system encompassing all formal relations. Another way of looking at organisation is to consider it as an essential function of management. The organisational function, thus, provides the formal structure through which work is defined, sub-divided, and coordinated. More specifically, organisation as a function of management involves the following steps² :

- (1) Determining the activities of the enterprise keeping in view its objectives;
- (2) Classification of such activities into convenient groups for the purpose of division;
- (3) Assignment of these groups of activities to individuals;
- (4) Delegation of authority and fixing of responsibility for carrying out such assigned duties; and
- (5) Coordination of these activities and authority relations throughout the organisation.

Organisational Structure in Universities

Harold Stieglitz regards the structure of the organisation as, 'The process of logically grouping activities, delineating authority and responsibility, and establishing work relationships that will enable both the organisation and the individuals to realize their mutual objectives'. Although good organisation structure is essential for the smooth and effective functioning of any institution universities have tended to be negligent in this important phase of management. It appears that university structures have grown more through expediency rather than

design, and although it tends to lead to inefficiency, many institutions have been slow to improve the condition. Harold W. Stoke expressed the same concern at these deficiencies when he said, "For many reasons colleges are not distinguished for clarity and efficiency of organisation. Yet the importance of good organisation can hardly be overestimated. It reduces frustration, conserves time and energy".⁴ With the increase in pressures on administration of universities more attention should be given to organisational structure in order to improve efficiency. Further, the university management should give careful attention to the framework of the institution and the individuals placed in that framework. If the person fits well in the structure, if he understands his place, and if his duties are well defined, he is more likely to be proud and happy in his relationship—his effectiveness is greatly enhanced.

The basic organisation structure of a university is a function of objectives, size, complexity and the individual institution's philosophy of education. Further, when the size of an institution grows and the scope of its teaching, research and public service activities widens, effective communication becomes more difficult to achieve and there arises the necessity for reorganising the structure of the university. As such the administrative organisation should be designed keeping in view these factors.

Criteria for Good Organisational Structure

The structure of any organisation is like the architectural plan of a building. The more clearly set out, balanced, and utilitarian the plan, the stronger and more serviceable the building. For the structure of the education enterprise to be deemed appropriate, consideration should be given to the following criteria : (a) the objectives of education and the types of activities required to achieve them; (b) the benefits of specialisation and how to maximise such benefits in the interests of the enterprise; (c) the limitations of functional authority and how best to distribute and harmonize the authority levels; (d) the problem of communication and to ensure effective communication between the levels and functions; and (e) the size, shape location, and capacity of the enter-

*Faculty Members, Department of Commerce & Business Administration, Nagarjuna University, Nagarjuna Nagar-522 510, A.P.

prise and what administrative structure best fits such an enterprise.

The structure of an enterprise affects the administration of the system. However, a good organisation structure alone is not a panacea for all the organisational problems. As Drucker argued :

"...good structure does not by itself produce good performance just as a good constitution does not guarantee great president or good laws, or moral society. But a poor structure makes good performance impossible no matter how good the individual manager or administrator may be. To improve organisation structure will therefore always improve performance."⁵

The American Management Association conducted a survey in 1952 which listed nine criteria as the most frequently used principles of organisation. The term "principles", as used in the discussion refers to the characteristics which the organisation is designed to meet : effectiveness, efficiency, division of work, functional definition with authority and responsibility, the chain of command, channels of contact balance, control and perpetuation.⁶ The report points out that these principles of organisation must be applied with common sense based on experience. These guidelines, therefore, would enable educational planners and administrators to determine when a new structure is fit for adoption. It would also enable those who assess the education enterprise to know what to look for in the structure of the system.

It is in this context that an attempt is made in this paper to analyse the present organisational structures of Indian universities and suggest some ways and means for restructuring them. To carry on this study, we have selected three universities viz., Delhi, Andhra and Nagarjuna. Even though they were selected on the basis of random sampling, due care was taken to see that not only established and new universities but Central and State universities were also covered by the sample since the management practices of these universities differ from one another. The data was collected from these universities through a questionnaire circulated among the officers of the universities and spot studies conducted by the researchers. Let us now discuss the organisation structure of the three selected universities, with reference to the above mentioned elements.

Elements of the Organisational Structure in Universities

The concept of organisational structure includes

certain elements and issues related to departmentation, centralisation and decentralisation, delegation of authority, span of control, unity of command, line and staff, committees, etc. Let us now discuss the organisational structure of the three universities in India, with reference to these elements.

Departmentation

Departmentation implies the creation of departments in an organisation. The term department is used to indicate a particular level in the organisation at which specific activities are carried out. Departmentation involves the division of activities and functions into groups for effective operation; the establishment of relationships between the individuals performing different functions in the given unit; the creation of conditions which would knit the group into a working unit; and the creation of definite hierarchy or structure (organisational chart or organisational flows). In a study of administrative organisations of higher education, John Dale Russell found: "A rather definite organizational pattern has emerged, by which four major areas of administrative functions are recognised...The four areas are the academic programme, student personnel services, business and financial management, and public relations."⁷ The major objectives of the organisation are :⁸

1. Primarily to free the president (equal to Vice-Chancellor in Indian Universities) and secondarily to free each of the four major administrative officers from all routine duties and routine decision-making. This freedom will allow more concentration on exceptional and broad problems.
2. To have every major function of the university represented by a Vice-President, with only exceptional problems and policy handled by the President and the governing board.
3. To group the activities of the university into an organisational framework that gives specialization and familiarity with problems which can be utilized in decision making at all levels.

As against these considerations, let us now discuss the present organisation structures of three universities, viz., Delhi, Andhra and Nagarjuna.

UNIVERSITY OF DELHI : The present organisation structure of the University of Delhi is given in Chart-1. It can be observed from the Chart that

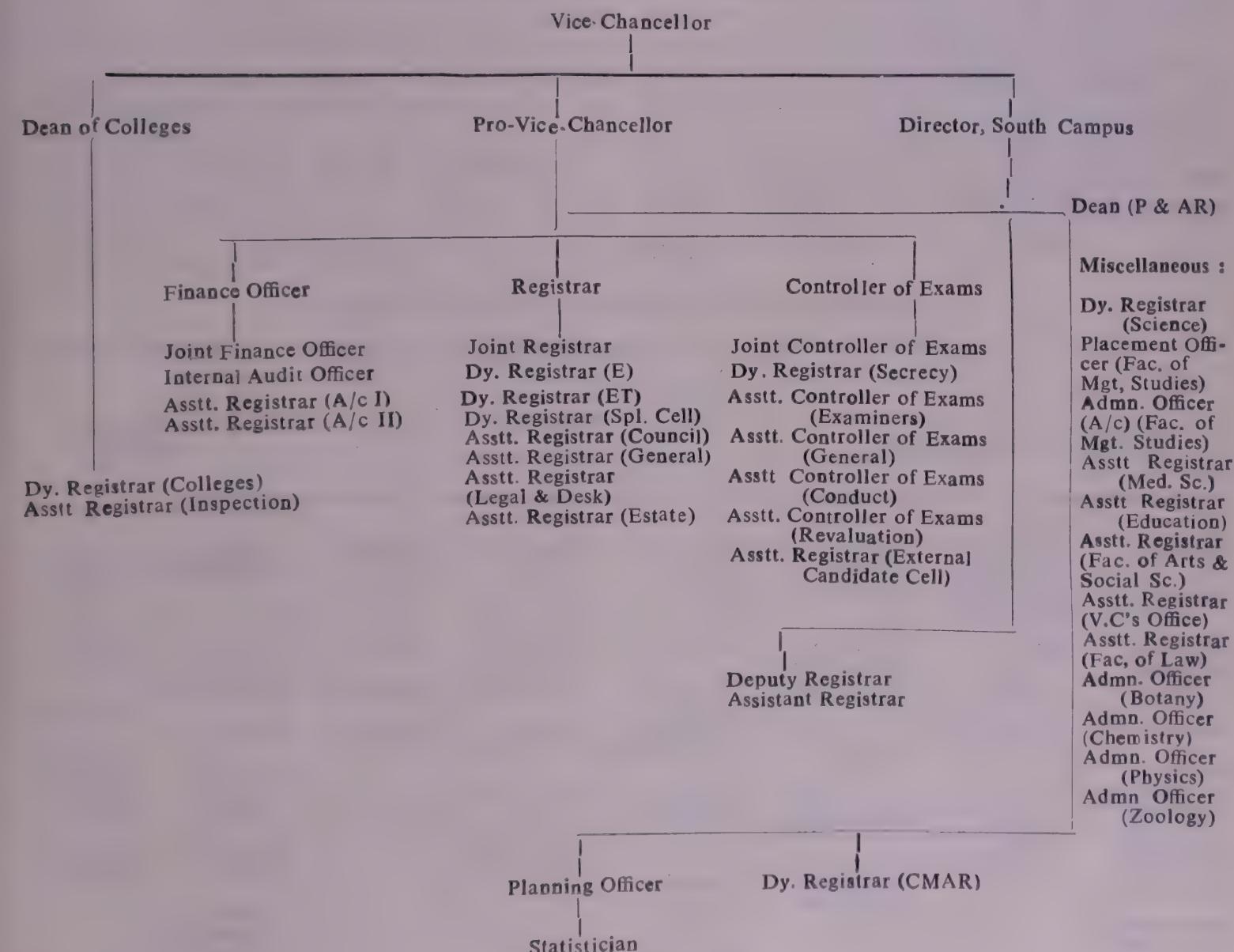
the present organisation structure of the university is arrived at on the basis of functions and geographical location. It can be observed from the Chart that the Vice-Chancellor is the head of the institution. The Dean of Colleges, Pro-Vice-Chancellor, and the Director, South Campus are the officers who are directly reporting to the Vice-Chancellor. It can also be observed from the chart that the position of the Pro-Vice-Chancellor is given more powers and under him the three main functions of the University viz., Finance, Administration and Examinations are included. In addition to these functionaries, the Dean (Planning and Administrative Reforms) is also

attached to Pro-Vice-Chancellor, increasing his span of control further.

ANDHRA UNIVERSITY : The organizational pattern of the Andhra University is given in Chart-2. It can be observed from the Chart that there are eight authorities equal to the rank of Registrar that are functioning under the Vice-Chancellor. Above these authorities, Rector is also required to work under the direct control of the Vice-Chancellor. It can further be observed from the chart that though the departmentation is based on the functions the main function of finance is kept under the charge of the Registrar.

CHART—1

ORGANISATION STRUCTURE OF UNIVERSITY OF DELHI



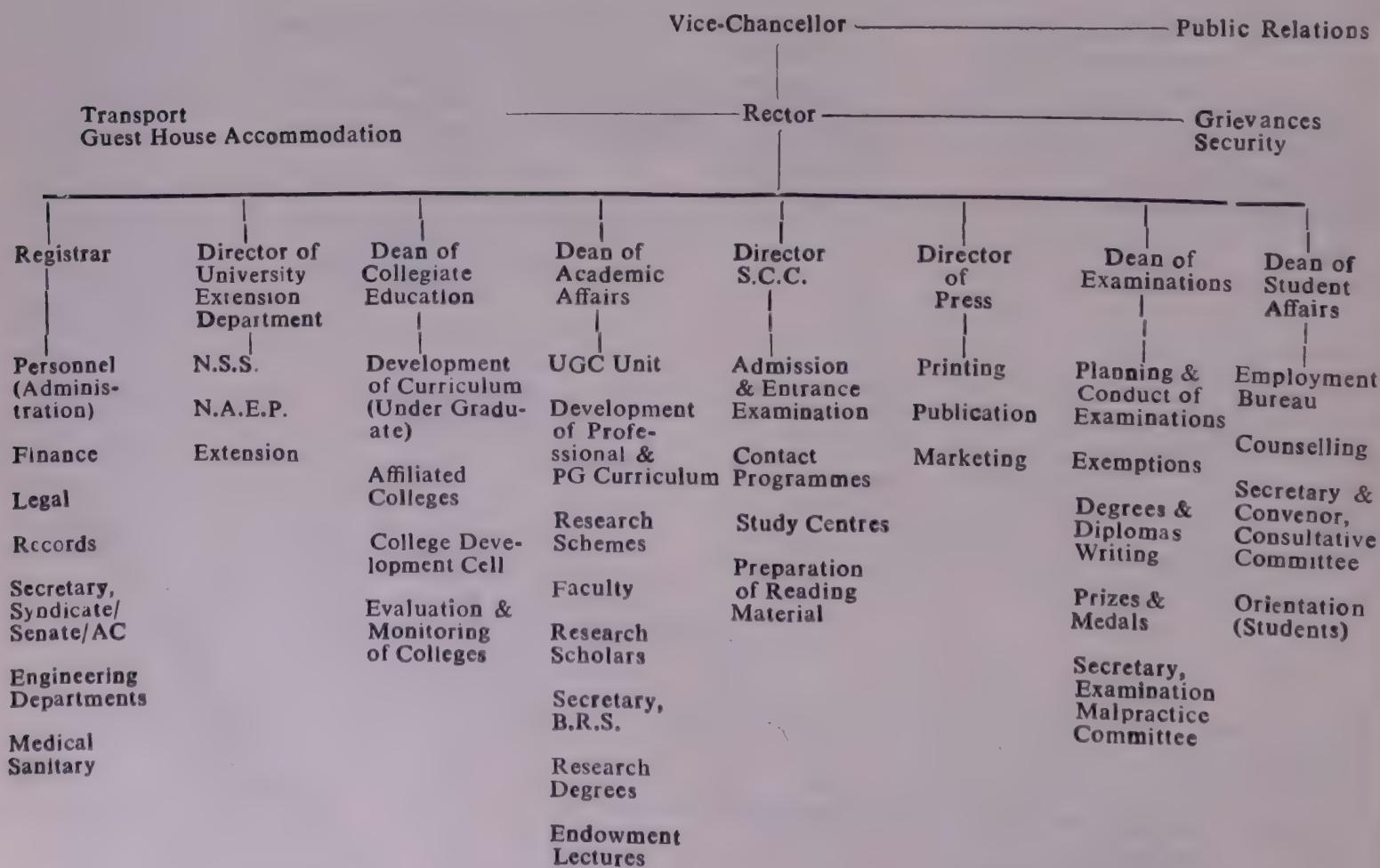
NAGARJUNA UNIVERSITY: The present organization structure of the Nagarjuna University is given in Chart-3. It can be observed from the Chart that the entire administration—academic and non-academic—is being looked after by the Registrar. Under him six authorities are functioning, equal to the rank of Deputy Registrars. It is only recently the University recruited the Dean of Collegiate Education, who is reporting to the Vice-Chancellor through Registrar. Further, it can also be observed that many unrelated activities were attached to different sections.

Thus, the organization structure of universities in India differs from university to university on the basis of the type of the university, size of the university, area of operation, number of campuses and functions. In developed countries like USA also the organization structure varies from university to university.⁹ A model organization structure generally followed by most of the large universities in USA is given in Chart-4 (on page 28). It can be observed from the chart that there are eight Vice-Presidents directly reporting to the President. The division of the func-

tions among these Vice-Presidents is very perfect. Further, they clearly define the terms of responsibility and authority for each control point in order to make the structure effective. In addition to this appropriate organization charts and manuals, faculty handbooks, and administrative guidelines are provided to ensure consistent policy administration.

On the other hand, the organization structure of the Indian universities is administrator(tion)-oriented, a charge which has been repeatedly levelled, and is based on the principle of "direct, control, coerce and distrust". Sixty years ago it was, perhaps, appropriate because of foreign rule and its attendant conditions and the character of the universities. It seems that the universities have belief in decentralization of responsibility and centralization of authority. When we compare the structure of Indian universities with that of the universities in USA, we literally find it upside down indicating lack of application of the principles of organization and management in the case of the former. In Indian universities the Vice-Chancellors are the Chief Executive Officers, but the Executive Councils/Syndicates have reduced

CHART—2
ORGANISATION STRUCTURE OF ANDHRA UNIVERSITY



their position to that of a subordinate by dealing with everything that Vice-Chancellors should be doing.

On the whole, it can be concluded that whatever be the organization form, certain basic functions must be performed, if the goals and objectives are to be accomplished. Objectives are normally determined by the authorities of the universities acting on the basis of respective Acts, Statutes and Ordinances. Planning, organising and controlling functions are the responsibility of the Vice-Chancellor, who in turn is required to delegate to the administrators the responsibility and authority for the performance of academic and non-academic and development functions. The various other principles of organisation like span of control, centralisation and decentralisation, unity of command, line and staff relationships, etc., are to be taken into consideration while planning the organisation structure of the universities.

Centralization and Decentralization of Authority

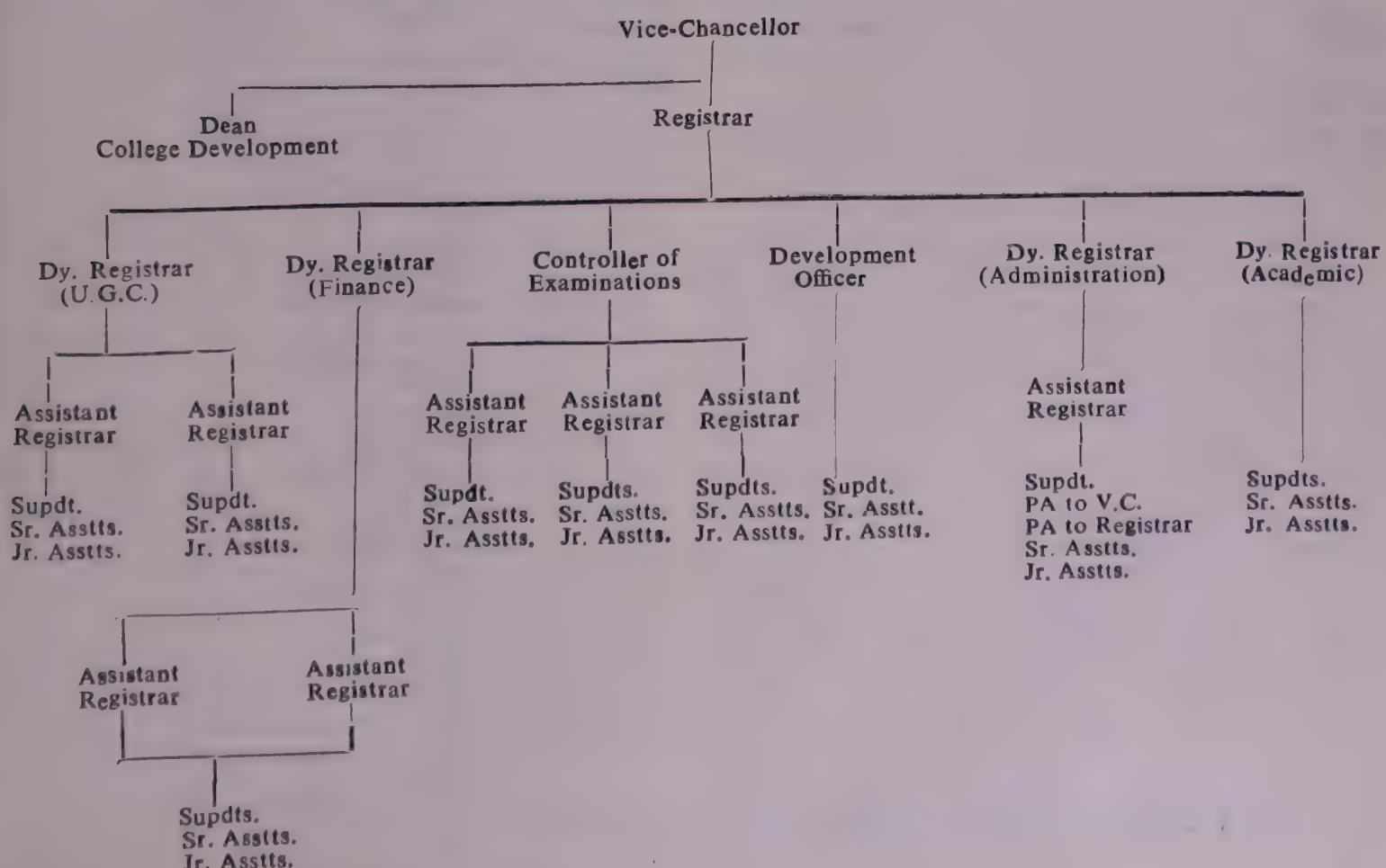
Centralization and decentralization refer both to the physical location of organisational facilities and

to the extent to which decision making, authority and responsibility in the organisation are concentrated or dispersed throughout the organisation. No ideal organisation can be completely either centralized or decentralized. However, in modern administration of education, there is an increasing tendency to decentralize facilities, authority and decision making.

As against this, the observation of the decision making in the selected universities reveals that there is lack of decision making at all levels in these universities. Even on routine and simple matters decisions are not taken by the concerned section heads but are passed on to officers who in turn pass them on to higher officers. Added to this, sometimes, suggestions are made that the matter may be referred to some committee or the other without looking into the validity or relevance and importance of the matter to be referred to the committee. Thus all the routine administrative matters irrespective of their importance are invariably reaching the Vice-Chancellors for their comments. Thus, the matters in the form of office notes, which for all practical purposes are a mere reproduction of the contents of the letter

CHART—3

ORGANISATION STRUCTURE OF NAGARJUNA UNIVERSITY



received, prepared by the clerical staff are passed on to the Vice-Chancellor, through various channels in the hierarchy, viz., Superintendent, Assistant Registrar, Deputy Registrar and Registrar. The net result

of the above practices followed conventionally over the years is leading to :

1. Unnecessary paper work in view of preparation of draft notes, typing, etc.;

CHART-4

ADMINISTRATIVE ORGANISATION—LARGE URBAN UNIVERSITY THE UNIVERSITY CORPORATION

THE BOARD OF TRUSTEES

Assistant To
The President

THE PRESIDENT OF THE UNIVERSITY

Legal Counsel
Federal Relations
Editorial Assistant
Administrative Assistant

Vice-President Finance	Vice-President Development	Vice-President Business	Vice-President University Relations	Vice-President University Administration	Vice-President Academic Affairs	Vice-President Student Affairs	Vice-President University Planning
Accounting	Business & Industry Council	Buildings & Grounds	Alumni Records & Mailing Control	Administration	Academic Computer Services	Athletics Chapel	Institutional
Comptroller	Associates Programme	Campus Security	Centre	Computer Services	Basic Colleges	Counselling & Testing	Research
Auditing	National Council	Real Estate Management	Information Services	Admissions	Business Administration	Deans of Men,	University
Budget		Suburban Campus	Press Bureau	Computer Centre	Education	Women, & Freshmen	Planning
Supervision		University Relations	Telephone Services	Educational Resources	Liberal Arts	Financial Aid	
Bursar			University Publications	Library	Engineering	Health Services	
Machine Operations			University Relations	Occupational Information Centre	Nursing	Student Activities	
Veteran's Affairs				Office Services	Pharmacy	Student Centre	
Auxiliary Services				Personnel Registrars	Bureau of Business & Economic Research Centre for Reading Improvement		
Book Store					Continuing Education		
Housing & Food Services					Division of Health Services		
Purchasing					Graduate Division		
					Arts & Sciences		
					Business Administration		
					Education		
					Engineering		
					Pharmaceutical Sciences		
					Management Development Centre		
					Marine Sciences Institute		
					Rehabilitation Institute		
					Research ROTC		
					School of Law Speech & Hearing Centre		
					University College Urban Affairs Office		

Source : Ana S. Knowles, *Handbook of College & University Administration*, (New York : McGraw Hill Book Co., 1970), p. 3.9.

2. Delays in decisions, causing inconvenience to administration, students, teachers, and society,
3. Feeling among the staff that the volume of work is high at all levels right from the clerical level to the senior officers as almost every paper received goes through all the levels in the hierarchy along with the officer's note;
4. The Vice-Chancellor being over loaded with routine administrative work leaving no time to pay attention to important policy matters; and
5. The work of committees increasing considerably.

In this context, the Andhra University Committee on University Office Administration headed by Prof. Gangadhara Rao aptly pointed out that 'Although there are four officers at the level of Assistant Registrar in the Examination Branch, they are neither empowered with adequate authority commensurate with their position in the organisation structure, nor do they seem to be exercising even the minimum authority vested in them. They have developed a habit of sending most of the files after scrutiny to the higher authorities. In the present structure, there is a Controller of Examinations and an Additional Controller of Examinations both of them of Deputy Registrar's cadre. There is no clear cut demarcation of their duties, responsibilities and authority. As a result, most of the files are being handled by both and further very few matters are decided at their level. Thus, 90 per cent of the examination work is referred to the Additional Registrar for decision making who in turn consults very frequently the Vice-Chancellor.'¹⁰

The Committee further elaborated that "A considerable part of the Vice-Chancellor's time, which is more precious is being devoted to matters which can be disposed off at lower levels. The present system, through its operation, is causing abnormal delay in paper setting, conduct of examinations and publication of the results apart from causing leakage of question papers. All this has resulted in much anguish and dissatisfaction on the part of the public at large. Therefore, what is urgently required is upgrading and strengthening the position of the Chief Executive of Examinations Branch and a clear cut demarcation of duties and responsibilities at different positions and entrusting them with adequate decision making authority."¹¹

The reasons that are contributing to the centrali-

sation of authority and power in universities are : lack of orientation to the staff at various levels; lack of strict observance of rules and regulations pertaining to various matters; absence of single point accountability in the present structure; absence of foolproof, clear and exhaustive rules and regulations pertaining to many matters; lack of clarification of roles, functions, and responsibilities at each level; and lack of confidence/initiative among the staff.

Delegation of Authority

The need for delegation of authority in an organisation gains importance with increases in the scope, services, departmentation and decentralisation in the organisation, and how best to delegate authority becomes a key element in the organisational structure of an establishment. An executive's true productivity is not measured by how much work he can do as an individual. Instead, it is measured by how much he can accomplish through others. The best executive is the one who has enough sense to pick good men to do what he wants done, and self-restraint enough to keep from meddling with them while they do it.

The study of delegation of authority in the selected universities reveals that there is no specific delegation of authority to different lower levels. Because of this, decision making is totally absent at almost all levels and even unimportant and routine matters are passed on to the higher officers. Due to lack of specific delegation of authority in these universities, the various officers including the Engineers, Medical Officers, Printing Press Managers, etc. dealing with matters purely technical in nature, have to depend on the Registrar's office and go through the entire process for decisions even on routine and simple matters. As a result, there is considerable delay in providing the requisite service causing resentment among the students, teachers and administrative staff. Prof. Gangadhara Rao Committee, while analysing the delegation of authority in Andhra University mentioned "The Committee has come to know that most of the files go to the levels of Additional Registrar, Registrar, Vice-Chancellor for disposal. Quite often, a note prepared by a Junior Assistant passed through five or six levels before it reaches the Vice-Chancellor for final decision. It has to come all the way back to the Junior Assistant to initiate implementation of the decision taken. All this is resulting in undue delay in the decision making and implementation. This also encourages the practice of shifting the responsibilities on the one hand and excessive

dependence on higher authorities on the other. All this leads to tremendous increase in pressure of file disposal work at higher levels which adversely affects their initiative and drive in policy-making.”¹²

The main reason for the inadequate or no delegation in the selected universities is due to the reluctance of the top administrators. They believe that they can make better decisions than their subordinates. Further, the administrators are hesitant to delegate due to the fear of losing their importance and control. In addition to that, the organisations of these universities are animated with an environment of distrust and in these circumstances the administrators are often reluctant to delegate. David D. Henry, now President of the University of Illinois, warned officers of the universities against this deficiency in themselves. “The business officer (in a university) who does not share his responsibilities with a competent staff, who arrogates to himself all final decisions, who insists that he alone through his signature or spoken word must pass upon every action of his department is inviting trouble.”¹³

Span of Management

The span of management, also called span of control or supervision, refers to the number of subordinates reporting to one superior. The principle of span of management argues that there must be some limit to the number of individuals that an administrator should control. There is no definite agreement on number of persons that can be controlled by one manager. Graicunas was perhaps the first to focus attention on the numerical limitation of span of management. He identified three types of superior-subordinate relationships : (i) direct single relationships; (ii) direct group relationships; and (iii) cross relationships. He developed a mathematical formula to demonstrate that with the addition of each subordinate, the number of superior-subordinate relationships increases rapidly.¹⁴

Lyndall Urwick found, “the ideal number of subordinates for all superior authorities.....to be four”, and “at the lowest level of organization, where what is delegated is responsibility for the performance of specific tasks and not for the supervision of others, the number may be eight or twelve”.¹⁵ Hamilton, a military observer, also generalised that there was a numerical limit to the number of subordinates that a manager could supervise effectively. He thought that the proper number of subordinates should be three near the top and six near the bottom of the organiza-

tion.¹⁶ The span of management thus, on the whole, depends on : (a) the administrator's (supervisor's) ability or capacity; (b) the nature of the job; (c) the experience, qualification or degree of independent action of the subordinates; and (d) the physical and/or technological conditions of the institution.¹⁷ The correct principle of span of management is that there is a limit in each managerial position to the number of persons an individual can effectively manage, but the exact number in each case will vary in accordance with the effect of underlying variables and their impact on the time requirements of effective managing. This basic principle does exist, has not been superseded, and is useful in guiding managers toward ably managing more subordinates and simplifying organisation.

The analysis of the selected universities reveals that the structure of the sections is not compact and wellknit. A closer examination of the span of control of these universities reveals some authorities at the higher level of the hierarchy, particularly the Registrar, have been dealing with more than 20 subordinates at a time and it is not known how they are able to cope up with the situation. Even at the lower levels the span is so wide that the middle level officers are also feeling a lot of difficulty in supervising many subordinates. The present tall organisations of these universities (having too many levels) is mainly responsible for generating a climate of bureaucracy and feudalism, which is against effective academic functioning.

Unity of Command

The concept of unity of command states that for any specific action or activity a subordinate should receive orders from only one superior. The purpose of course, is to prevent conflicts and confusion from arising when a subordinate receives directions in the same area from two or more superiors. In this sense, unity of command seeks to maintain clear authority relationships between superiors and subordinates. According to Simon : “Administrative efficiency is... enhanced by arranging the members of the organization in a determinate hierarchy of authority in order to preserve ‘unity of command’. Unity of command enables every employee to know whom to report and who should report to him. The more completely an individual has a reporting relationship to a single superior, the less the problem of conflict in instructions and the greater the feeling of personal responsibility for results.¹⁸ Although it is possible for a subordinate to receive authority from two or more

superiors and logically possible to be held responsible by all of them, the practical difficulties of serving two or more masters are obvious. An obligation is essentially personal, and authority delegation by more than one person to an individual is likely to result in conflicts in both authority and responsibility.

The principle of unity of command, which ensures efficient reporting and control, helps to avoid confusion, conflict and lack of action, and enhances the morale of the employees, was a misnomer in the universities. Instances were not lacking wherein almost all the departments, the employees receiving orders on the same subject from more than one officer at a time due to duality of command.

In fact, it is the higher authorities who are responsible for the violation of the principle of unity of command in these universities. Some of the higher officers of these universities are seen calling the junior most employees, without bothering about the hierarchy. In turn, the lower level employees are taking this as an advantage and are seen taking the files directly to the higher authorities, bypassing their immediate superiors. Thus, in practice the junior or senior assistants are reporting not only to their immediate superiors but also to many higher authorities upto Vice-Chancellor.

Line and Staff Authority

Line authority refers to the basic and fundamental authority in the organisation, which implies the ultimate authority to command, act, decide or direct on matters affecting others. On the other hand the staff in an organisation include all the workers, technicians, professional experts, etc., who control, direct, or implement their various decisions in accordance with the policies stipulated by the line-staff. The distinction between line and staff authority and/or structure in most organisations has been very controversial. This is more so because many organisations in the modern times do not operate in the dichotomised line and staff structure. However, it is worthy of every educational administrator to understand and appreciate the possible implications of the line-staff relationships in education.

The non-teaching staff in the university has only a staff role, since they have to implement the established policies of the institution and they do not have authority to take decisions. Of course, the line and

staff authority dichotomy in educational institutions may not be clearly discernible. For example, the Registrar is often delegated the responsibility of determining whether an individual meets the institutional qualifications for being considered as an eligible candidate for a vacant position. If the Registrar disqualifies an individual whom the dean of the faculty wants to appoint to this position, the dean may feel that the Registrar has assumed "line" relationship with his department. In such a situation, the Registrar is actually serving in a staff relationship to the line officer who delegated to him the responsibility of acting on his behalf. Eventhough, the non-academic personnel are to act as the staff, their role in the administration of the universities cannot be undermined. On the contrary, the more service to the institution in a staff relationship that top administration expects from its non-teaching staff, the stronger will be the personnel operation.

The line and staff conflict also exists between the authorities of the universities. Though the Court/Senate or Academic Council are given line functions alongwith the Executive Council, it is the Executive Council which is exercising all the powers in practice. The conflict between these bodies is still persisting in the universities due to the non-specification of clear powers to these authorities. For instance, in Delhi University there is an ambiguity in the powers and functions of the Court and the Council. The Court is supposed to be the supreme body of the University and therefore the Court should be executing these policies. In practice, however, the Council formulates, and executes the University policies and the Court has been reduced to the level of a "report receiving body".¹⁹

While coming to the relationship between the teachers and non-teachers, all are aware that the universities are created mainly for teaching and research, and the academic are required to occupy the line positions. In the process they take the help from the non-teaching staff and thus, non-teaching staff are required to help or facilitate the line in arriving at the decisions. But unfortunately, over the years due to the increase in the number of non-teaching staff and the centralisation of authority in the universities, the non-teaching staff at the higher level are trying to occupy the line functions and dictate to the academics. It is surprising to note that in the recent past, some of the non-teaching staff unions are claiming that they should be given the posts of Registrar, Controller of Examinations, Finance Officer, and even the Vice-Chancellor.²⁰

Committee Management

A committee normally refers to a group of organisational members who are responsible for solving a specific problem or accomplishing a specific task.²¹ The primary function of committees is to make or suggest decisions on problems requiring an integration of needs of various departments or divisions, viewpoints or ideas.

The administration of universities is essentially done through a large number of committees. The Acts of all the universities have provided certain statutory committees such as committee for the Selection and Appointment of Faculty, Finance Committee, Academic Planning and Evaluation Committee, etc. In addition, in the university Acts, it has also been laid down that every authority of the university, viz., Court/Senate, Syndicate/Executive Council, Academic Council, etc., shall have the power to appoint committees for dealing with any matter within their purview. As a matter of fact, the committee system in universities is an ubiquitous and dominant feature of university administration in India. In USA also, in education, faculties of great universities, jealous of academic freedom and distrustful of administrative power, traditionally circumscribe the authority of presidents and deans with a myriad of committees. In one large university more than 300 standing committees share in administration or advise on policy, ranging from the academic senate and the budget committees to committees on committees, coordinating committees, and committees on alumni records, university welfare, and maintenance of order during examinations.²²

Apart from the meetings of the statutory university bodies, there is such a proliferation of such committees and sub-committees that the engagement books of the university officials and academic staff are usually far too full leaving them hardly much time for quiet, sustained and constructive work. Apart from any other consideration, the welter of committees and sub-committees involves heavy administrative costs. The following are the observations based on an analysis of the various aspects of the committees and their meetings in the Indian Universities.

(1) The terms of reference of large number of committees have not clearly been specified at the time of constituting the committees. This is because of the fact that committees are constituted first at

the slightest provocation and a search for terms of reference is made later, and hence the terms of reference of a large number of committees are overlapping.

(2) No specific time limit is prescribed to the committees to complete the investigations and present its recommendations. The responsibility for follow-up is not vested with any person.

(3) The officers of the administration are not taking the terminal responsibility of disposing/decision-making even on routine matters. All such cases are referred to some committee or the other leading to delay and inconvenience to the various interested parties.

(4) The number of items in the agenda to be deliberated at each meeting is very high. This is due to the fact that even simple, routine and irrelevant items are referred to the committees by the officers. Apparently, the committee can deliberate on only a fraction of the items in the agenda leading to postponement of a large number of items.

Suggestions

From the above discussion it can be easily understood that the above areas, even though small, are posing serious problems to the administrators of the universities. This situation is arising because the administrators are not showing real interest in resolving these problems. Hence, it is time for them to take genuine interest in solving these problems and restructure the present organisation structures of the Indian Universities completely before these problems disrupt the entire university system. This argument is supported by various management experts also. For instance, on this matter Prof. A.K. Shah expressed his opinion in the following words :²³

"A critical evaluation of the existing structural arrangement, as outlined above, reveals that, in addition to various extra pathological consequences emanating from the super imposition of sub-systems like Institutes, Colleges, etc., over this basic structure the vague and inadequate definition of authority and jurisdiction of Deans, Directors, Principals, etc., causing almost continuous inter-personnel jurisdictional, functional, and personality clashes and squabbles it suffers from certain fundamental operational limitations that are inherent in the set up itself. These deficiencies, quite evident even today are expected to become even more glaring in times to come; and therefore, call for urgent administrative action before they bring about a total breakdown in the overall university system."

The structural arrangement regarding basic university functions obtaining in the Indian universities, therefore, calls not for rationalization and here and there tinkering, it requires a complete supplanting by an alternate system geared to the present and future needs. In this regard the following measures, in our opinion, are of great use :

Reorganization of the Structure of the Universities

If one goes through the organisational structure of universities in India, one finds that though they have formal organizational structures, these are never followed in practice. As indicated earlier, there is an urgent need for reorganising the entire structure of university administration in India. The basic considerations in the design of the organisation structure of the university administration are:

1. Identification of the activities required to meet the objectives/purposes of the organisation of the university administration;

2. Systematic grouping of related activities,

according to similarity in basic objectives/purposes;

3. Each working unit constituting the organisation of university administration performs a clearly useful role in contributing to the achievements of the objectives of the organisation;

4. Maintain, as far as possible, homogeneity and proper span of control appropriate to the particular needs;

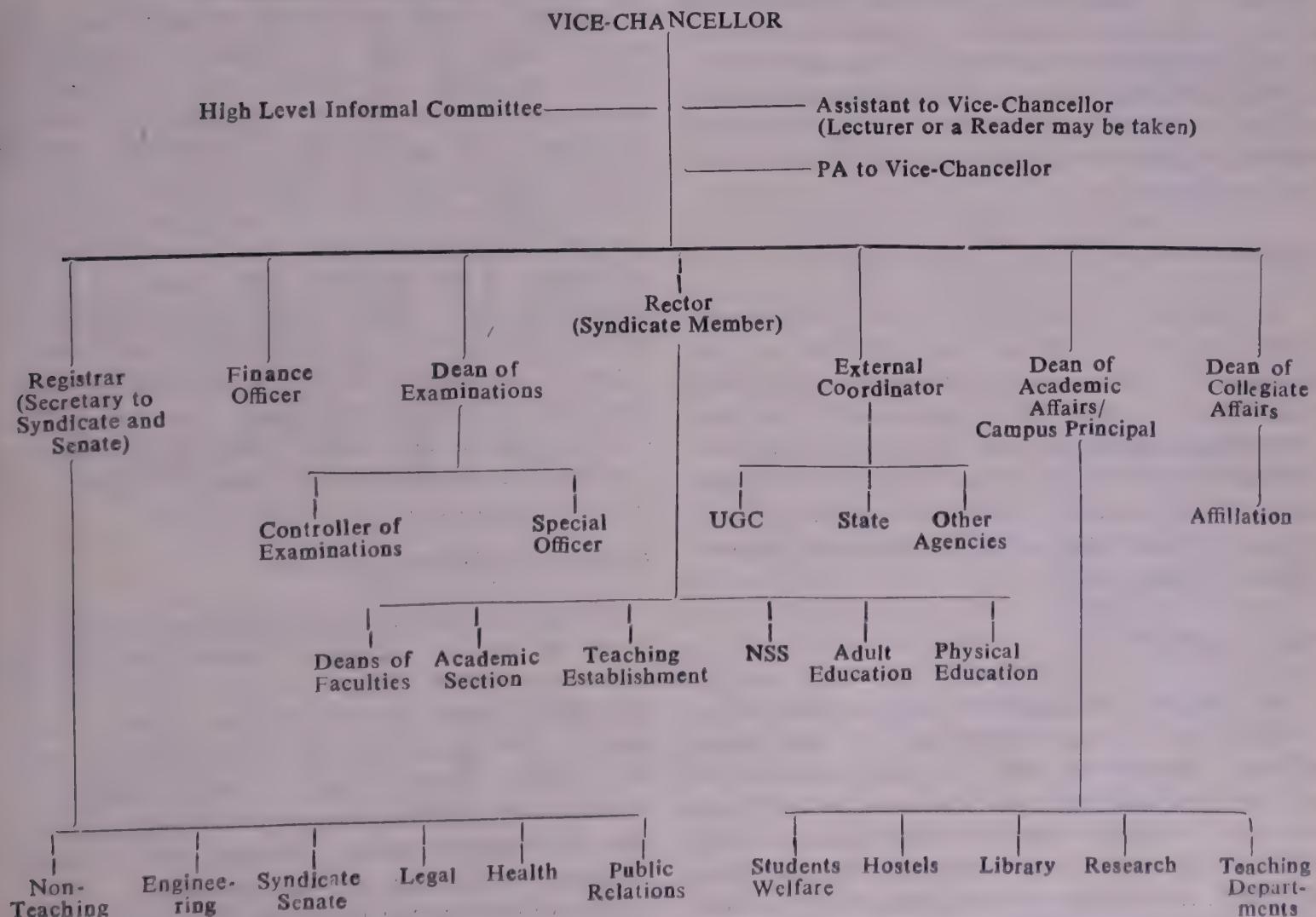
5. Assigning definite and clear cut responsibilities at each level; coupling responsibility with corresponding authority and delegation; and

6. Systematic decentralization of the entire administration for effective decision making.

While reorganising the structure, it should be kept in mind that there should be a minimum number of levels in the organisation hierarchy. A tall organisation having too many levels generate a climate of bureaucracy and feudalism which goes against the effective academic freedom. The proposed organisational structure for the universities is given in Chart-5. It can be observed from the chart

CHART—5

PROPOSED ORGANIZATION STRUCTURE OF UNIVERSITY ADMINISTRATION



that in the proposed reorganisation, there will be seven officers having equal stature, reporting directly to the Vice-Chancellor. The powers and responsibilities of these officers are discussed briefly hereunder.

Rector/Pro-Vice-Chancellor

The Acts of many universities provided for the appointment of Rectors / Pro-Vice-Chancellors. Various Committees including the Kothari Commission, Gajendragadkar Committee and Madhuri Shah Committee also recommended for the appointment of Rector/Pro-Vice-Chancellor for the effective management of university campus and also to reduce the burden of the Vice-Chancellor. However, still some Vice-Chancellors are not preferring to appoint Rectors/Pro-Vice-Chancellors due to the fear of competition from them in future. In view of this, the Vice-Chancellors may be allowed to choose the persons of their own choice as Rectors/Pro-Vice-Chancellors and the period of those persons should be co-terminous with that of the Vice-Chancellor. All academic matters should be kept under the control of the Rectors/Pro-Vice-Chancellors. It is better if the membership of the Syndicate/Executive Council is given for them, so that they can advise the Executive Council/Syndicate on academic matters effectively. In the absence of the Vice-Chancellor, they may be allowed to take care of all issues related to the university.

Registrar

At present, in majority of the universities, almost all the activities are referred to the Registrar for their onward approval by the Vice-Chancellor. In the process the post of the Registrar is becoming more powerful than that of the Vice-Chancellor. In view of this, the powers and functions of the Registrar should be clearly defined, keeping in view that he is the head of the non-academic matters only.

Finance Officer

At present, in majority of the universities in India, the finance department is the worst affected department. This is mainly because of the absence of qualified staff at all levels in the finance division. It is unfortunate to note that many of them do not even know how to maintain various accounts. No doubt, the budgets are prepared every year, but they are being prepared by persons who are not

having any professional experience at all. There is no control either on the sources of income or expenditure. It is no wonder to note that some of the universities are not even preparing their final accounts, since their inception, as a result of which nobody is in a position to know the exact particulars about the assets and liabilities of the university.

The respective Acts of the universities have provided for many powers to the Finance Officers. But, unfortunately, they are either misused or not used at all. Further, the Acts and Statutes of the universities did not specify the qualifications of the Finance Officer. It is time for the Governments and the Vice-Chancellors to think about this important issue and efforts must be made to appoint only professional people as Finance Officers. The finance officer, in future, should be an independent person and he should be made to report directly to the Vice-Chancellor. He should also be made secretary to the Finance Committee (without membership).

Dean of Examinations

Another officer to be appointed by the Vice-Chancellor is the Dean of Examinations. He will be made incharge of the entire examinations of the university and should report to the Vice-Chancellor directly. In the examinations branch, two sections may be created, of which one section should be kept under the charge of the Controller of Examinations, who will be dealing with the conduct of examinations and the issue of various certificates to the students. The second section is to be headed by a Special Officer, and he should be responsible for the setting of question papers, valuation of papers and other confidential works. The Dean is required to coordinate the activities of both the sections and should plan for the effective conduct of examinations, publication of results and issue of certificates to the students in time.

External Coordinator

The primary functions of the external coordinator is to act as an effective liaison between the university administration on the one hand and the UGC, State Government and other funding agencies on the other. His main function will be to bring funds from various agencies. At present, there is practically no coordination between the development works, finance, and concerned teaching departments in the universities, which is leading to delay in the timely implementation/execution of the development programmes sanctioned by

the UGC, State Government and other agencies. The net result is that statistical information on various aspects sought by the UGC, the State Government and other agencies from time to time is hardly being sent in time. There is a lot of backlog of work in this regard. Inability to utilise the earmarked grants by the universities will have adverse affects in the long run as the funding agencies may drastically cut their future allocations. Therefore, the external coordinator should play an effective role not only in getting funds but also in coordinating the execution of works in time.

Dean of Academic Affairs/Campus Principal

The Dean of Academic Affairs/Campus Principal should be made incharge of the campus students, teachers, library and research. All the problems relating to the campus college/colleges are to be resolved by him.

Dean of Collegiate Affairs

In the recent past, the UGC sanctioned the post of Dean of Collegiate Affairs to all the affiliating type of universities for coordinating, supervising and managing the affairs of the affiliated colleges. At present, majority of the affiliated colleges are established without proper facilities and nobody knows about the problems of these colleges, unless they themselves approach the universities. In view of the situation prevailing at present in case of majority of universities, the Dean of Collegiate Affairs should play a very critical and crucial role in strengthening the affiliated colleges from academic and non-academic sides.

While reorganising the structure of the universities, the following points are to be kept in mind :

1. In the universities, main importance should be given to academic roles and not to the administrative roles. Otherwise, the teachers may see their preferred career paths in administration rather than academic.

2. Administrative roles should be only instrumental in promoting the academic work in the universities and should not assume unnecessary importance to become a competing system within the universities. If non-academic roles are given too much importance, parallel empires may emerge in the universities which may threaten and obstruct academic functions. This does not mean that non-

academic roles are not important at all. They may be given importance to the extent they facilitate the functioning of the universities and various subsystems.

3. Seniority of persons in the universities should be delinked from their appointments to non-academic leadership positions. It is often complained that persons who have been in the universities for a long time tend to take over the main controlling functions and the young bright people who enter the system do not get an opportunity either to learn how to perform these functions or to demonstrate their ability to manage some functions. Appointments to administrative roles may, therefore, be made from amongst all levels of teachers, irrespective of their seniority. If an attempts made to locate bright young people who can perform a particular function more effectively, they may be appointed for a few years on these positions.

4. All academic administrative positions should be held for a time-bound period and the assignment of people to these roles should be wholly delinked from status and seniority. This does not mean an automatic rotation system in which 'every one will be given a chance'. Appointments to these positions would be carefully made by the Vice-Chancellor on the basis of appropriateness of individuals to fulfil such roles, but the period for which the appointment is made can vary from position to position. The heads of departments may be in position for 2-3 years. The Deans with a major departmental programme on hand might be in that position for 5 years.

Vice-Chancellors' Secretariat

At present, most of the Vice-Chancellors are not having their own officers and for everything they are depending on Registrar's office. Even in universities where such offices were there, they are not fully equipped. There is every necessity of creating and strengthening Vice-Chancellor's Secretariat immediately, particularly in affiliating type of universities. The Vice-Chancellors may also constitute a high level informal committee (with three members) to advise them on important matters. This committee should meet once in 15 days to review the progress and follow-up action. The Vice-Chancellors may also constitute three-member committees (one of these will work as member-secretary) for giving them advice on various matters relating to students, teaching and non-teaching staff, transport, physical

development of the campus, academic, affiliations, examinations, extra-curricular activities, finance, and long-term planning policies. No doubt, there are statutory committees like Finance Committee, but the committees recommended above are purely to investigate and analyse the problems and advise the Vice-Chancellor.

Clarity in Responsibilities

Definite and clear cut responsibilities should be assigned to each staff member with provisions for exercising adequate control at different levels. Nothing encourages confusion, recrimination, and jurisdictional conflict more than unclear assignment of responsibilities amongst the executives. It is, therefore, important that every officer knows his responsibilities and the area of his work. Allocation of responsibility should not be arbitrary. The responsibilities should be proportionate to the level of the person in the overall hierarchy.

To enable the above mentioned to happen, each of the branches will have one or more sections depending on the volume and heterogeneity in the activities assigned to the branch. Every section should be a nucleus operating unit encompassing three levels, viz., officer level, supervisory level and supporting level. An officer should be incharge of a branch while a superintendent or assistant superintendent should be incharge of a section depending upon the volume and nature of work in that section. Every officer heading a branch should break the entire work of the branch into component activities. The breakdown of activities should be as far down as to determine the job to be performed by each individual. Specific job assignment should be made to different subordinates for ensuring a certainty of work performance.

Decentralization and Delegation of Authority

Decentralization is a fundamental aspect of delegation; to the extent the authority is not delegated it is centralized. At present all the universities suffer to a large extent from centralization of the administrative power. Any small problem arising in a college is referred to the universities and it is expected that all decisions on such matters are ultimately taken by the Vice-Chancellor. Therefore, it is necessary to immediately decentralize the administration of the universities particularly in relation to the colleges. In view of the present undue delays in decision making and implementa-

tion, a new scheme of delegation of powers is to be evolved conferring adequate decision making authority at different levels. The section officers, assistant registrars, deputy registrars, and other officers may be empowered to take decisions on certain matters which are within the rules.

A suggestive list of delegation of powers, as suggested by Prof. M. Gangadhara Rao Committee, is given below²⁴ :

<i>Subject</i>	<i>Officer to whom the power is delegated</i>
1	2
1. Sanction of casual leave to the members of non-teaching staff upto the level of Section Superintendents.	Asstt. Registrar
2. Sanction of casual leave to Asstt. Registrars and Deputy Registrars.	Registrar
3. Sanction of earned leave to the members of non-teaching staff upto the level of Section Superintendents.	Deputy Registrar
4. Sanction of earned leave to Asstt. Registrars and Deputy Registrars.	Registrar
5. Sanction of earned leave to the teachers of the University upto the level of Lecturers.	Deputy Registrar
6. Sanction of earned leave to Readers and Professors.	Registrar
7. Sanction of periodical increments to the non-teaching staff upto the category of Senior Assistants.	Deputy Registrar
8. Sanction of periodical increments to Section Superintendents and Assistant Registrars.	Asstt. Registrar
9. Sanction of periodical increments to Deputy Registrars.	Deputy Registrar
10. Sanction of periodical increments to the teachers upto the level of Lecturers.	Registrar
11. Sanction of periodical increments to Readers and Professors.	Deputy Registrar
	Registrar

12. Permission to teachers to accept examinerships, paper setting etc., where there is no financial commitment to the university and where such teachers can be permitted without prejudice to their normal duties in the departments if recommended by Principal.

13. Appointment to the non-teaching posts upto the category of Senior Assistants from the approved panel.

14. Sanction of bata to drivers as per rules and rates approved by the Syndicate.

15. Forwarding of application to jobs outside.

Deputy Registrar

Deputy Registrar

Deputy Registrar

Deputy Registrar

Deputy Registrar

However, the delegation of authority will be effective only when the following steps are taken by the authorities :

1. A clear definition of roles is a pre-requisite for effective delegation of responsibility and authority and acceptance of accountability.
2. Responsibility and authority for decisions and task accomplishment should be delegated to the lowest level in the organization at which there is sufficient competence and information for efficient and effective decision making or task performance.
3. Delegation of responsibility for decisions or for task accomplishment should be accompanied by commensurate formal authority.
4. Delegation of responsibility for decisions or for task accomplishment should be accompanied by commensurate accountability and the provision of controls so that both the individual and higher management can identify deviations from plans in time to make the necessary corrections.

Committees

The concept of decision making and management through committees is by far superior over vesting the decision making and management in the hands of

a single person how so ever competent he may be. This is because of the fact that in the former there is ample scope for effective interaction exchange of thought, deliberation, consultation, etc., leading to generation of new ideas. However, in order to enable the committees to be meaningful in the administration of universities, the following recommendations are made :

1. In the interest of the administrative efficiency, it is suggested that the number of committees and sub-committees which at present are set up on the slightest provocation should be minimised. To achieve this, a streamlining of the administrative machinery in the university would be desirable.
2. The terms of reference of the committees together with the time limit should be made specific right at the time of constituting the committees.
3. The composition of the committees should as far as possible be small.
4. The number of items to be deliberated and the points the committees should consider should as far as possible be minimum.
5. The committees should be reserved for questions of strategy of policies only. No routine matters should be referred to committees. The officer concerned in the university administration should be made accountable to ensure that no routine matters for which the rules, regulations, ordinances, etc., are clearly specified are referred to the committees.
6. Meetings of the committees should be as infrequent as possible and business should be pre digested by small intergroups.
7. As far as possible the consideration of the matter in the agenda should not be postponed to avoid wastage of paper work, stationery, etc. The concerned officer should ensure that all explanatory notes giving the necessary information is placed before the committee for which he should be made accountable.

Coordination

Coordination is the synchronization of different activities for achieving common goals. Smooth functioning of the university administration and the definite achievement of its objectives depend on

sound coordination. The accountability for proper coordination should primarily rest with the officers. They should play an important role in coordinating the work of their subordinates. Frequent formal and informal meetings and get-togethers of officers and representatives of external agencies should be held to bring in better internal and external coordination.

Conclusion

The actual implementation of these suggestions may evoke a lot of opposition from the academics and administrators alike, particularly so far as the existing universities are concerned. Such a resistance would be quite natural and may be flow from such human factors as inertia, narrow self or sectional interests, misplaced fears, doubts and suspicions, disinformation, etc. These would have to be suitably tackled so as to secure the willing, wholehearted and unreserved cooperation of all persons affected by the change scheme and involved in its implementation. In the end, it can be undoubtedly said that, if one is determined to solve the problems, it may not be that much difficult to resolve the problems of the universities and achieve the objectives for which they were established. □

REFERENCES

1. Trewatha L. Robert & M. Gene Newport, *Management*, (Texas : Business Publications, Inc., 1982), p. 188.
2. A report on the Study of Improvement of Management in University Administration—University of Poona—Organization, Analysis, Systems and Procedures, Administrative Staff College of India, Hyderabad, pp. 37-38.
3. Eric H. Frank (ed.), *Organization Structuring*, (London : McGraw Hill, 1971), p. 20.
4. Harold W. Stoke, *The American College President*, (New York : Harper & Brothers, 1959), p. 39.
5. Peter F. Drucker, *The Practice of Management*, (London : Heinemann, 1963), p. 194.
6. Ernest Dale, *Planning and Developing the Company Organization Structure*, Research Report No. 20, (New York : American Management Association, 1952), p. 196.
7. John Dale, Russell, *Changing Patterns of Administrative Organization in Higher Education*, Annals of American Academy of Political Sciences, Vol. 301, (September, 1955), p. 26.

8. Glaze, Thomas Edward, *Business Administration for Colleges and Universities*, (Baton Rouge : Louisiana State University Press, 1962), pp. 68-69.
9. Asa S. Knowles (ed.), *Handbook of College and University Administration*, (New York : McGraw Hill Book Company, 1970), p. 3.9.
10. Report of the Committee on University Office Administration, (Visakhapatnam : Andhra University Publication, July, 1985), p. 16.
11. Ibid., pp. 16-17.
12. Ibid., p. 59.
13. David D. Henry, *The Business Officer's Role in Top Management*, *College and University Business*, Vol. 11, No. 3, (September, 1951), p. 19.
14. Graicunas, V.A., Relation in Organization, *Bulletin of the Management Institute Geneva*: International Labour Office, 1933 in *Papers on the Science of Administration*, Luther Gulick & Lyndall Urwick (eds.) (New York : Columbia University Institute of Public Administration, 1937), pp. 181-187.
15. Lyndall Urwick, *Axioms of Organization*, *Publishers Administration Magazine*, (London), pp. 348-349.
16. Agarwal, R.D., *Organization and Management*, (New Delhi : Tata McGraw Hill Publishing Company Ltd., 1982), p. 126.
17. Ibid., p. 127.
18. Harold Koontz, Cyril O'Donnell & Heinz Weirich, *Management*, (McGraw Hill International Book Co., 1984), p. 369.
19. Pradeep R. Mahendiratta, *University Administration in India and the USA : Approaches, Issues and Implications*, (New Delhi : Oxford and IBH Publishing Co., 1984), p. 197.
20. Annual Meeting of the Non-Teaching Staff of Andhra Pradesh Universities.
21. Trewatha L. Robert & M. Gene Newport, *Management*, Op. cit., p. 520.
22. Harold Koontz, Cyril O'Donnell & Heinz Weirich, *Management*, Op. cit., p. 335.
23. Shah, A.K., Structuring Basic University Functions—An Alternate Model, *University News*, Vol. XXVI, No. 11, March 14, 1988, p. 3.
24. Report of the Committee on University Office Administration, Op. cit., pp. 60-61.

TO OUR READERS

Knowledgeable and perceptive as they are, our contributors must not necessarily be allowed to have the last word. It is for you, the readers, to join issues with them. Our columns are as much open to you as to our contributors. Your communications should, however, be brief and to the point.

Undergraduate Colleges—A Mission to Fulfil

S.M. Israney*

The undergraduate college in India, with its long venerable tradition, has a unique mission to fulfil—one that will enrich and, at its best, transform. There is a conviction that something in the undergraduate experience will lead to a more competent, more concerned, more complete human being.

This is the hope. It is one of the most enlightened visions any society has collectively endorsed. The undergraduate college is the place where higher education begins. In India, today, we have approximately 6000 undergraduate colleges and 180 universities. This rich array of institutions has opened doors to citizens of all ages and all backgrounds. More than 4 million students are now enrolled in some form of postsecondary education, a remarkable achievement (or paradox?) in a country where the literacy rate is only 36%.

India's enduring belief in education has often been inflated. Formal schooling has not always been the ladder to success. Still, throughout our history, each new generation has been expected to do better than its elders, to set new goals, and even strike out in new directions. As a result, growing proportion of children (atleast in the absolute sense, though not relatively) from poor and working class families have completed high school, entered college, and moved on to careers unimagined by their parents.

We have a system of universal access to higher education. Its portals are open virtually to all who wish to enroll and an almost unlimited choice of subjects is offered. Outwardly, India's higher education system, with its size, openness, diversity, and scholarly achievement, is the envy of the third world.

A Troubled Institution

And yet, today, it is realised that the undergraduate college, the very heart of higher learning, is a troubled institution. In a society that makes different and contrary demands upon higher education, many of nation's colleges are more successful in credentialing

than in providing a quality education for their students. There is no realisation of the real aims or goals of higher education vis-a-vis the nation. The institutional expectations are often too low and incoherent. The blame does not lie with the academic community, it is a failure of the whole system which still resembles the British pattern.

The undergraduate college in India is today beset with many problems, which ought to be taken notice of :

(1) *Problem of discontinuity*

The first problem is the discontinuity between schools/junior colleges and degree colleges. Today, educators from the separate levels, with few exceptions, carry on their work in isolation. The curriculum is out-of-date, irrelevant and disjointed, and guidance is inadequate. Students find the transition from school/junior college to degree college haphazard and confusing. They are dissatisfied with the admission procedures and requirements and are troubled by the costs (not necessarily by instructional cost) and capitation fees. Part time and older students, a rapidly growing part of Indian higher education, also face disturbing problems of transition.

This separation has led to a mismatch, a disturbing one, between faculty expectations and the academic preparation of entering students. Many young people who go to college lack basic skills in reading, writing, and computation—essential prerequisites for success. The faculty are not prepared, nor do they desire to teach remedial courses.

The nation's education structure should be a seamless web. But there are many questions : Is it possible for the educators from separate levels to work together to define a basic education system and strengthen the proficiency of students in language and computation ? How can the procedures for college admissions, counselling, selection and orientation be improved ? And, can the nation's colleges expand educational opportunities for the growing number of adults and historically bypassed students ?

*Reader I/c, Economics of Education Unit, Department of Economics, University of Bombay, Bombay-400098.

2. Confusion over Goals

The second issue is confusion over goals. Scrambling for admissions and driven by market place demands, many undergraduate colleges have lost their sense of mission. They are confused as how to impart shared values on which the vitality of both higher education and society depends. The disciplines have fragmented themselves into smaller and smaller pieces, and the undergraduate students find it difficult to see clear patterns in their courses and to relate, what they learn, to life. As one writer puts it "There can be no educational postulates so long as there are no generally accepted postulates of life itself". And thus colleges appear to be searching for meaning in a world where diversity, not commonality, is the guiding vision. As Alvin Toffler observed, a properly motivated person can learn anything he wants to learn without sitting in the classroom. The present higher educational system is based on certain assumptions which are no longer true, one of which is that there is a fixed body of knowledge to be learned, and that once you have learned this fixed information, you can then use it for the next 50 years because the world is going to be the same. This is no longer the case. There is a mismatch between what is taught in the conventional formal higher educational institutions and the needs of the people in the society. These institutions continue to be strongly tradition bound, have resisted transformation and are too rigid and too institutionalised. They are preoccupied with producing graduates to fit into a world that is not going to exist when those young men get there. So much emphasis is placed on how to get bigger, and not how to change. As Sir Eric Ashby says they display what a biologist calls 'phylogenetic inertia'.

Closely related is the conflict between careerism and the liberal arts. Today's students worry about jobs. Narrow vocationalism, with its emphasis on skills training, dominates the Campus. As one Principal put it : "They (management) are turning this college into a supermarket where we are willing to put anything in the catalogue so long as it will sell". A trustee of a college once remarked : "It is all right to talk about liberal arts goals but we have to face upto what students want today".

These conflicts prompt fundamental questions : Is it possible for administration, faculty, and students, with their separate interests to agree on a vital mission for undergraduate education ? Can the curriculum serve individual interests while providing a coherent view of the human condition ? Is the academic 'major' simply

a means to prepare specialists with narrow technical skills ? Above all, can the liberal and useful arts be blended during college, as they must inevitably be blended during life ?

3. Divided Loyalties

The third problem is divided loyalties and competing career concerns within the faculty. Professors are expected to function as scholars, conduct research, and communicate results to colleagues. Promotion and tenure of teachers hang on research and publication. But undergraduate education also calls for a commitment to students as well as effective teaching. Frequently, the faculty are torn between these competing demands.

There is the related matter of faculty renewal. In recent years, career prospects for young professionals have diminished. Opportunities for mobility are limited and options for professional growth restricted. At the same time, the number of part time faculty is increasing. These developments threaten the unity and vitality of the professoriate.

The challenge faced by the faculty is suggested by these questions : What is the balance that should be struck between teaching and research ? Are there enough research facilities both in terms of place and reading material available in an undergraduate college ? Is it appropriate for different types of higher learning institutions to have different criteria for faculty evaluation ? How can faculty be professionally renewed/upgraded ?

4. Divergence between Conformity and Creativity

Fourth, there are tensions between conformity and creativity in the classroom. Time and again, we hear faculty complain about the passivity of students whose interests, they say, are stirred only when reminded that the material being presented will be covered in the examination. In the classrooms, we generally find an absence of vigorous intellectual exchange, a condition for which faculty as often as students bear responsibility.

Still, there remains a vision of undergraduate college as a place where teachers care about their students : where, in the classroom, traditions can be challenged and new ideas tested. One must, therefore, consider the following questions : Is it possible for students during this area of mass education, to become independent, self-directed learners ? How can faculty

improve their teaching so as to encourage creativity and critique? And how can all resources for learning, on and off the campus, be connected?

5. Separation and Isolation

Fifth, a great separation is found, sometimes to the point of isolation, between academic and social life on campus. Colleges specially with hostels, like to speak of the campus as a community, and yet what is being learned in most residence halls today has little connection to the classrooms; indeed, it may undermine the educational purpose of the college. The idea that a college stands for parents is today a faded memory. But on many campuses, there is a great uncertainty about what should replace parental care. In fact, it is found that residential and commuter students live in two separate worlds. In this regard many questions arise: How can life outside the classroom support the educational mission of the college? How should tension between student freedom and institutional authority be resolved?

6. Disagreement on the Governance of College

The sixth problem is the disagreement one finds over how the college should be governed. As the complexity of higher education has increased, confidence in the decision making process appears to have declined. The managements are caught in the crossfire of conflicting pressures from 'within' and 'without'. Faculty often appear to be more loyal to their discipline than to the institutions they teach in. And when students are asked to participate in campus governance, their involvement is sporadic or politically inclined. Can students, faculty, and administration build community through improved communication?

7. Assessing the Outcome

The seventh issue is how the outcome of a college education should be measured. Today, the academic progress of students is assessed by professors. Class grades are dutifully recorded. The final mark of achievement is the degree/diploma—a string of English alphabets, which presumably signifies an educated person. But good teachers are not necessarily good evaluators and there is legitimate concern about quantifying a complex learning process. The college has no way to assess the quality of education overall. This raises many questions: How can college goals and the evaluation of student achievement be more closely linked? Should there be assessment beyond course grades? Are the testing procedures now used adequate to the task?

8. Gap between the College and the Larger World

This brings us to the final concern. Though listed last, it touches all the rest and its influence is all pervading. Today, we find a disturbing gap between the college and the larger world. There is some sort of 'parochialism' or narrow outlook bordering on alienation that seems to penetrate many higher learning institutions, an intellectual and social isolation that reduces the effectiveness of the college and limits the vision of the student. There are however, some college like, X'aviers College, Bombay, which have risen above these limitations. One, therefore, feels compelled to ask: How can the undergraduate college help students gain a wider perspective and pre-



UNIVERSITY NEWS

A Weekly Chronicle of Higher Education

Subscription Rates

Institu- tions	Inland		Foreign	
	Rs.	Teachers & Students in India	Air Mail	Surface Mail
1 Year	80	60	US \$ 80	US \$ 50
2 Years	150	110	\$ 150	\$ 90
3 Years	200	150	\$ 200	\$ 125
5 Years	300	225		

Single Copy: Rs. 2.50

Subscription is payable in advance by Bank Draft only in favour of Secretary, Association of Indian Universities.

Advertisement tariff available on request.

Address Subscriptions & Enquiries to :

Under Secretary (Publications)

Association of Indian Universities

AIU House, 16 Kotla Marg
New Delhi 110002.

pare them to meet their civic and social obligations in the neighbourhood, the nation, and the world ?

Here, then, are the eight points of tension : the transition from school to college, the goals and curriculum of education, the priorities of the faculty, the condition of teaching and learning, the quality of campus life, the governing of the college, assessing the outcome, and the connection between the campus and the world.

The problems are not new. They have, in one way or the other bedevilled higher education for generations not only in India, but also in the advanced countries. But the points of tension are today also the points of unusual opportunity. On campuses all across the country we find renewed interest in general (liberal) education, upgradation of quality, and in the evaluation of the undergraduate experience. Above all, we also find that there is a wellspring of tradition and talent waiting to be tapped.

Constructive Debate

What we urgently need today is a constructive debate about the meaning of the undergraduate college and a willingness to make this part of the educational enterprise more vital and enriching. At the same time, the diversity of our system must be acknowledged and protected. The responses to the challenge of enriching the experience will surely differ from one institution to another and, in the end, the quality of the effort must be measured not by the certainty of the outcome, but by the quality of the quest.

The Indian college is, I believe ready for innovation and there is an urgency to the task. The nation's colleges have been successful in responding to diversity and in meeting the needs of students from the job orientation view point. They have been much less attentive to the larger, more transcendent issues that give meaning to existence and help students to stand on their own feet and be independent.

Our nation and the world need well informed, inquisitive, open-minded young people who are both productive and reflective, seeking answers to life's most important questions. Above all, we need educated men and women who not only pursue their own personal interests but are also prepared to fulfil their social and civic obligations. And it is during the undergraduate experience, perhaps more than at any other time, that these essential qualities of mind and character are refined.

A ringing call for the renewal of the Indian college may, at first instance, seem quixotic. Not only has cultural coherence faded, but the very notion of commonalities seems strikingly inapplicable to the vigorous diversity of contemporary life. Within the academy itself, the fragmentation of knowledge, narrow departmentalism, and intense vocationalism are the strongest characteristics of collegiate education.

Still, I believe the undergraduate experience can, by bringing together the separate parts, create something greater than the sum, and offer prospects by which the channels of our common life will be deepened and renewed. □

WELCOME TO MODERN TIMES

*If you are a
Newspaper, Magazine, Book Publisher, Printer, Service Bureau or
Corporate Client*

WATCH OUT FOR

DTP SERVICES & CONSULTANCY (P) LTD.
LASER TYPESETTERS OF BOOKS, MAGAZINES, JOURNALS AND NEWSPAPERS

Faster Service Accurate Performance Cost Efficient

A-86/3, Majlis Park, Azadpur, Delhi-110033 Phones : 7216733, 7123075

We are simply more professional

EFFECTIVE TEACHING IN COLLEGES

Sunil Behari Mohanty*

Studies in Effective Teaching

Effective teaching in colleges involves creation of an appropriate environment for proper learning of students. Gagne (1974) defines instruction as "the set of planned external events which influence the process of learning and thus promote learning". (p. 4) The research studies are not unanimous on various factors that contribute to effective teaching. Some of the findings of research studies are as follows :

Smith (1977) reported about the importance of student involvement. Cranton and Hillgartner (1981) referred to the importance of teacher enthusiasm and rapport of the teacher with the students. Ford (1981) pointed out that effective teaching takes into account the thoroughness of student understanding and the student acceptance of learning experiences. Levison-Rose and Menges (1981) pointed out the importance of paying greater attention to individual differences and long term measures of change.

Murray (1983) suggested that effective teacher personality characteristics consisted of sense of humour, encouragement of student participation, and sensitivity to student feelings. Oddi (1983) reported that self-directed teaching was found to be more effective than lecture based instruction. Rogers (1983) referred to student preference for classrooms characterised by a more personal teacher-student orientation. Greenson (1985) also reported similar findings.

Dunkin and Barnes (1986) reported that the effectiveness of lecture versus discussion oriented instruction depended largely upon the goals in the minds of instructors. Frederick (1986) reported that lecture method could be useful when applied with enthusiasm and creativity.

Greenson (1988) conducted a comparative study of traditional teacher centered instruction and a non-traditional student centered instruction. The former strategy consisted of lectures, formal tests and assignments. The latter consisted of personal goal setting and monitoring, conferences and informal group discussion tests. It was found that student centered instruction generated more questions and ideas than

the teacher centered instruction. Roza and Fernandes (1988) pointed out that modern teaching methodologies laid greater emphasis on "knowing" instead of "what to know". They pointed out utilisation of a number of techniques for effective teaching.

Singhal (1988) conducted a study of teaching strategies at undergraduate and postgraduate levels. It was found that both the groups rated intellectual efficiency of teachers highly. While postgraduates preferred creativity and intellectual efficiency, the undergraduates preferred flexibility, personal relations, involvement, confidence and motivation to achieve. The groups required different academic orientations and classroom management skills. The strategies reported useful for effective teaching were ability to maintain student attention and classroom task engagement and continuous monitoring of classroom situation. The characteristics of effectiveness were (i) creativity, (ii) flexibility, (iii) personal relations, (iv) maturity, (v) involvement, (vi) confidence, (vii) intellectual efficiency, and (viii) motivation to achieve.

Five Categories

The studies mentioned above are only a few in comparison to large number of studies in the field of effective teaching in schools. Generally the studies on teaching effectiveness in colleges are of five categories; Each category and some of the studies conducted on the basis of that category are given as follows :

- (a) Student ratings : Central (1977b), Doyle and Whately (1974), Frey, Leonard and Beatty (1975), Marsh, Fleiner and Thomas (1975), Sullivan and Skanes (1974) and Singhal (1988).
- (b) Colleague evaluation : Davis (1977), Eble (1984), Goldschmid (1978), Miller (1982) and Orpen (1988)
- (c) Academic performance of students : Lucie (1973) and Rose (1976)
- (d) Administrator ratings : Glass (1974)
- (e) Self-evaluation : Beard (1975), Centra (1977a), Hilderband and associates (1986), Simpson (1966).

As mentioned above criteria for evaluation of

*Head, Department of Education,
Bhadrak College, Bhadrak 756 100, (Orissa)

teaching effectiveness have been mainly of five categories. Hence criteria for teaching effectiveness found on the basis of one category may not be accepted universally. Therefore, Conard (1982) has suggested use of a number of these categories for evaluating teaching effectiveness in colleges.

Methods of Teaching in College

Various methods are used for teaching in college. Some of these are (a) lecture, (b) discussion, (c) individualized instructional strategy, (d) utilisation of educational technology, and (e) group teaching strategies.

Lecture Method

Lecture method is the most popular method. Joshi (1979) conducted a survey on 190 teachers of 18 colleges and 3 universities of Andhra Pradesh, Gujarat, Kerala, Madhya Pradesh, Rajasthan and Uttar Pradesh. He found that most of the respondents used lecture method. Rai (1982) conducted a study of methods of teaching for teaching social sciences at undergraduate level and found that 93.87 per cent of the respondents used lecture method. Popular use of lecture method was also reported by Bligh (1976), Brown (1985), Brown (1987), Conard (1982), Eble (1976) and McLeigh (1976).

The reasons for the popularity of lecture method among students are as follows :

- (a) It does not require any thing except paying attention;
- (b) If a student is compelled to listen to a lecture because of a compulsory attendance rule, he or she while pretending to listen may sleep, day dream, do crosswords and puzzles, write letters, discuss with peers matters not related to the topic taught by the teacher in a whisper tone and throw papers or stones at peers as part of mischief, etc.;
- (c) It is a traditionally accepted method;
- (d) It is interesting to listen to a lecturer having good dramatic talent; and
- (e) It can provide major information to students in situations where textbooks are not available.

The reasons for which lecture method is popular among college teachers are as follows :

- (a) It does not normally require any material to the classrooms;

- (b) It provides the college teachers opportunity to exhibit their skills of (i) memorisation, (ii) sequential presentation of facts, and (iii) oratory;
- (c) It provides enjoyment to many teachers;
- (d) It has gained stature since old times—it is the method used by the teachers of teachers;
- (e) It symbolises scholarship;
- (f) It is very helpful for
 - (i) conveying information (Kulik and Mc Keachie 1975 and Brown 1985);
 - (ii) providing framework for a detailed study to be undertaken by students;
 - (iii) managing large sized classes;
 - (iv) quick coverage of the course;
 - (v) stimulating interest of the students; and
 - (vi) generating understanding of students.
- (g) It can be used along with other techniques such as films, film strips, transparencies, slides, tapes, video presentation; and
- (h) It is economical (Kozma, Belle and Williams 1978);
- (i) It is the only method available for college and university teachers of the institutions which do not provide facilities for use of other methods found to be more effective but requiring utilisation of materials; and
- (j) It can help an unprepared college or university teacher to hide his or her weaknesses by giving uninterrupted lecture and not allowing students to question.

The lecture method has however many limitations. Lecturing is not teaching in the true sense of the term. Postman and Weingartner (1969) pointed out that lecture method does not bother about the amount of reception of the lecture by the students. Normally the lecturer gives the blame to the learner saying that "Oh, I taught them that, but they didn't learn it". Such a statement according to Postman and Weingartner amounts to a salesman remarking that 'I sold it to him, but he didn't buy it'. But a good salesman has to ensure that his products are bought by the customers. Similarly, a good teacher has to see that his lectures are properly received by the students. Rogers (1977) remarked that lecturing is like a drug; some get addicted to lecturing. They also lecture in situations, where lecturing is not necessary. The limitations of the lecture method may be listed as follows :

- (a) It proceeds at no pace;

- (b) It is generally one way communication;
- (c) It does not cater to individual differences among students;
- (d) It is a poor method of stimulating thought process;
- (e) It does not ensure effective participation of the student in the teaching learning process. During lecture, a student may day dream, sleep, play with peers, do cross words, write letters, etc., while keeping eye on the lecturer;
- (f) It encourages students to become passive and dependent (Brown et al 1973);
- (g) It is not related in important ways to student learning (Cross 1976);
- (h) In case of repetition of lecture, enthusiasm is reduced (Cross 1976);
- (i) Methods of discussion, symposium, and supervised study are more effective than the lecture method (Gupta 1982).

Lectures have been categorised in various ways. Bakhtar (1982) reported five clusters of lecturing styles. These were (i) oral lectures, (ii) exemplaries, (iii) information providers, (iv) amorphous, and (v) self-doubters. Oral lectures do not use audio-visual aids. Exemplary lectures are related to objectives, logically presented and supplemented with audio-visual aids. These repeat important points, use structuring tactics and summaries. The information provider type of lectures can be dictated from notes and are generally presented poorly. Lectures in pure sciences, applied sciences and engineering sciences are usually information providers. These types are more concerned with step by step transmission of knowledge. Amorphous type of lectures are not well structured and are poorly presented. They do not have well defined objectives. The self-doubter type of lectures dislike the practice and doubt the effectiveness of the presentation. Bakhtar (1982) found that lecturing styles were not significantly different according to the years of experience. The styles differed according to subject areas. 88 per cent of the respondents liked lecturing. Brown (1985) reported the findings of Entwistle (1981) regarding the key features of the lecturing process which were (i) intention, (ii) transmission, and (iii) receipt of information. Brown (1987) pointed out that explaining was the centre of lecturing. Other skills were demonstrating, narration, use of audio-visual aids, comparing and contrasting, and generation of student interest.

High (1988) developed a 39 item questionnaire and distributed it to 466 college students. The respondents

were asked to rate each of the 39 characteristics on a seven point Likert type scale in terms of their importance in evaluating a good teacher. The analysis revealed four main factors which were (i) responsiveness to students, (ii) subject matter preparation, (iii) personality, and (iv) discipline. The University Education Commission (Ministry of Education 1949), Desai (1975), Lenhart (1981), Joshi (1986) etc., have suggested certain measures for effective lecturing. These may be listed as follows :

1. Proper selection and organisation of content,
2. Specification of the instructional objectives and making students understand them,
3. Proper budgeting of time,
4. Creation of proper physical setting,
5. Sparing time for introduction of the lesson before presentation of the topic,
6. Keeping an eye on the student audience to find out the extent to which they are responding to lectures and to scan the whole group of the students instead of focussing attention to a part;
7. Appropriate language skill to have a balanced lecturing and to avoid hesitant lecturing punctuated by hundreds of 'er's and 'um's and to avoid speaking too quickly,
8. Appropriate use of audio visual aids : Mentioning important points on the blackboard, using audio visual aids along with the lecture such as using overhead projector instead of blackboard so that one can write while facing the students, etc.,
9. Putting questions to students in course of lecture for getting feedback,
10. Appropriate modulation of voice—audibility of the voice to last bench, variation in tempo, amplitude and pitch of voice to stress various aspects of presentation,
11. Providing appropriate non-verbal cues—gestures by face, hands, etc.,
12. Providing humour during lecture,
13. Providing pauses at suitable intervals to provide opportunity to students to think,
14. Undertaking discussions at intervals,
15. Providing reinforcements to responses of the students to teacher's questions,
16. Undertaking realistic assessments of the knowledge of the students,
17. Avoiding standing at one place or making too much movement during the lecture,
18. Appropriate explaining skill,
19. Appropriate demonstrating skill,

20. Appropriate skills of narrating, and comparing and contrasting,
21. Generating student interest,
22. Building self-confidence,
23. Establishing rapport with students,
24. Providing synopses and reading lists in place of dictating notes,
25. Illustrating the lecture with appropriate examples, and
26. Summarising the lecture before leaving the class.

There are some of the strategies. Each teacher has to use them according to his own capability and demand of the situation.

Discussion Method

Discussion method is popular because of the following advantages :

1. "Teachers and students alike may inquire, examine and respond in a discussion session" (Conard 1982);
2. It reveals "the misconceptions, biases and emotional reactions of the student. The teacher who minimises student participation dams up one of the most useful channels of feedback" (McKeachie 1978) ;
3. It helps in the development of suitable attitudes, beliefs and preferences (Flynn and LaFasso 1972);
4. Students give more preference to discussion than to lecture (Eble 1976);
5. It helps in the development of skills of speaking, listening and group leadership (Gage 1976);
6. It helps in the learning of difficult tasks (Costia 1972);
7. It provides better learning opportunities (Eble 1972, and Gall and Gall 1976);
8. It helps in the development of critical thinking (Smith 1977); and
9. It helps in the development of inquiry skill.

This method has certain limitations, some of which are as follows :

1. It cannot cover the course as is possible through lecture;
2. In case of large sized classes, this method may create indiscipline in the classroom; and
3. This method demands more knowledge than expected in case of lecture method from a teacher.

These are some of the limitations. This method can be utilised effectively by combining it with lecture method. Lecture cum discussion method is better in case of large sized classes. In small sized classes, discussion method is suitable. Teachers generally use discussion method in tutorial classes.

Individualised Instruction

There have been many individualised instruction strategies some of which are computer assisted instruction, learning modules, personalized self-instruction or Keller plan, learning contract, etc. Computer assisted instruction has been proved effective in case of students who have gained certain hold over the subject. Effective utilisation of this strategy has been referred to in studies conducted by Grubb and Selfridge (1963), Goodlad (1971), Jamison, Suppes and Wells (1974), Edwards et al (1975) and King (1977). Learning modules are "self-contained independent units of a planned series of learning activities designed to help students accomplish certain well defined objectives" (Goldschmid and Goldschmid 1974, p. 16). The audio-tutorial system referred to by Postlethwaite and associates (1972) is also a special learning module. These modules are prepared by the teacher before hand for use of the students. Personalized self-instruction or Keller plan is a student paced programme substantiated by lectures, demonstrations and utilises peers as proctors (Ruskin 1974). Learning contract is another type of individualised instruction strategy wherein the teacher and the learner come to a written agreement about objectives of learning, content of learning and evaluation of learning outcomes, etc. Utilisation of these types of individualised instruction strategies requires more of the teacher's time than required in normal lecture method. For this reason, many teachers do not like to utilise these strategies. Use of these strategies also requires more knowledge of the subject matter from the teachers. Similarly these strategies do not help slow learners. Hence a normal classroom teacher may do injustice to slow learners by introducing these strategies for all students. These strategies may be used for learning of gifted students.

Utilisation of Educational Technology

Modern methods of teaching utilise educational technology to improve the standard of teaching. "Educational technology with its recordings, tapes, copying machines, film and television seems increas-

ingly able to carry the burden of didactics" (Brubacher 1977, p. 87-88). Educational technology includes use of computers, television, radio, films, video, and charts, maps, graphs, etc. Utilisation of educational technology has given rise to open universities in different parts of the world. Use of television may or may not be more effective than lecture, but it can cover larger audience. Use of educational technology requires possession of hardwares and softwares by the institutions and possession of necessary skills and sparing of adequate time by the teachers. Some teachers feel that use of television may not be very much effective. Mackenzie, Eraut and Jones (1970) found no difference between teaching through television and lecture. In spite of such findings, television has certain advantages which lecture does not have, such as better explaining about techniques of space travel, working of the human body or small machines, etc. In cases where a small experiment or operation cannot be shown to a group of students, its video film can be shown, with the facilities of reviewing, etc. Inadequate utilisation of educational technology has been found not only in underdeveloped or developing countries but also in developed countries. Gosalez (1988) studied faculty opinions and practices of media utilization in the six regional colleges of the University of Puerto Rico and the factors influencing its use. The survey method was utilised for the purpose. 35 per cent stratified random sampling method was utilised for selecting 153 members. The study revealed that the faculty utilisation of media was minimal. Technology faculty members had better attitude than arts and science faculty members. The educational technology used frequently by the teachers consisted of overhead projector, transparencies, charts, graphs, classroom displays and bulletin boards. The members reported five barriers to effective educational technology utilisation, which were

- (a) Inadequate classrooms for use of educational technology,
- (b) inadequate training of teachers in use of educational technology,
- (c) insufficient allocation of resources for educational technology,
- (d) lack of appropriate reward system for teachers for use of educational technology, and
- (e) inadequate time available for teachers to select, locate and preview commercially available educational technology softwares such as films, video recordings, tapes, etc.

These difficulties pointed out in case of Puerto Rico are also applicable in case of other countries. The author was a student of Diploma in Community Education Course of the University of Edinburgh of U.K. during the session 1978-79. There was no attempt for adequate utilisation of educational technology except use of overhead projector, which was done presumably to supplement the nonavailability of space for blackboard. The educational planners throughout the world need to give more attention to the availability of educational technology resources and training for their utilisation so that the quality of instruction improves and a significant amount of time is saved.

Group Teaching Strategies

Modern teaching methods include a large number of group teaching strategies such as learning cell, controlled discussion, step by step discussion, associative discussion, case discussion, during lecture discussion, tutorial, seminar, snow ball groups, cross over groups, horse shoe groups, T-groups, syndicate, brain storm, synectics, fish bowl, role play/simulation and gaming exercises, interactive teaching, project, etc.

- (i) **Learning Cell** : Lenhart (1981) described learning cell activities as follows :

As a preparation for work in the learning cell all students read one and the same text and write down questions about the most important points.

At the beginning of the period, the students are split haphazardly into pairs. Partner A begins with his first question and when the other partner B has answered and has, perhaps, been corrected by A, B puts his first question and so on.

While this is going on the member of staff or the assistant circulating among the partners is asking questions and advising the learning cells, whenever problem arises." (p. 53)

- (ii) **Controlled discussions** : These techniques are organised by the teacher by providing opportunities to students to put questions and make comments on various aspects of the deliberations made by the teacher.
- (iii) **Step by step discussion** : In this strategy, the students are taught through audio-visual

equipment such as VCR, audio cassettes, films, television, etc. Sometimes cyclostyled notes are also provided. At times, the teacher intervenes and explains a concept. Opportunities are provided to students to express their doubts which get clarified by the teacher.

(iv) **Associative discussion** : In this strategy, the students assume leadership in deciding the topic and steering the discussions. The teacher intervenes only when it becomes essential so as to help students "see themselves as capable of change" (Abercombie 1979).

(v) **Case discussion** : In this approach, in a group session, a case history or problem is presented by the teacher for discussion by the students. Various aspects of the problem are discussed and solutions suggested (Easton 1982).

(vi) **During lecture discussion** : In this strategy, during the course of a lecture, when sticky situations arise, the students are asked to discuss the problem for 2 to 5 minutes.

(vii) **Tutorial** : It is a small group discussion strategy. A tutorial group generally consists of 15 to 20 students. The teacher gives assignments and evaluates these so as to provide formative evaluation. Tutorial activities are generally meant for clarifying doubts of the students and helping advanced students to proceed at a faster rate.

(viii) **Seminar** : In this strategy, generally 8 to 20 students participate (Jaques 1988). It is a normal practice in most of the colleges. This practice need to be strengthened.

(ix) **Snow ball groups** : In this technique, various aspects of the problem are noted by the students in course of the lecture session. During the break, the students discuss the problems with their neighbours. The results of these discussions are presented in larger sessions.

(x) **Cross over groups** : A class is formed into several groups. Each member of the group is given an identity mark. After each group meeting, the groups are reformed by taking in each group one member from the earlier groups.

(xi) **Horse shoe groups** : 'Horse shoe' is the shape of the sitting arrangement for the group discussion. In this strategy, the students change their positions. At the end, the outcomes are discussed and a lecture is given by a teacher or a student.

(xii) **T-group** : In this technique, attempts are made to develop self-awareness abilities and interpersonal relations. The "here and now" relationships are discussed with each other, (Shafer and Galinsky 1974 and Smith 1980).

(xiii) **Syndicate** : A class is divided into nearly six groups. Each group is given assignments to be completed cooperatively within a specified period of time (Collier 1980).

(xiv) **Brain storm** : In this technique, problems are generally solved by helping generation of free ideas. Different aspects of this strategy include (a) no attempt at criticism or evaluation, (b) encouragement to every participant to "free wheel" his or her ideas, (c) preference for quality of discussion than quantity, and (d) combining and building up of ideas.

(xv) **Synectics** : This strategy is an improvement upon brain storming technique. It utilises devices such as metaphors, making the strange familiar or vice versa and utilising fantasies to extend imagination (Stein 1975).

(xvi) **Fish bowl** : In this technique, the students are made to sit in two circles. While inner circle students participate in discussion, the outer circle students observe the pattern of argument style of interaction, etc.

(xvii) **Interactive teaching** : This technique has four components—response, reaction, challenge and modification. It is used in case of tutorials, preceptorials, group discussions and seminars (Roza and Fernandes, 1988).

Flechsig (1979) reported certain other strategies which can be used in case of teaching in colleges. These include exploration project, action project, the INFO bank, clarifying educational environment, learning by teaching, the multi-media study centre, the network, the workshop, etc. Educationists have also suggested strategies such as peer tutoring, team teaching, assignment, self-learning kit, sensitivity sessions, etc. The college teachers need to be aware of these techniques and utilise them whenever situation demands. They may modify each of these strategies to suit their particular situation. Such attempts lead to innovations.

Free Progress System of Education —An Innovation in Teaching

The UNESCO Inventory of Educational Innovations in Asia (APEID 1976) mentions about the Free

Progress System of Education followed at the Sri Aurobindo International Centre of Education at Pondicherry. This innovation was tried out first in 1967. Strategies adopted by the teachers of the higher course at that time were as follows :

1. The choice of a subject for study should be freely made by each student, and it should reflect a real and serious quest of the student;
2. Each topic thus selected would constitute a short or a long project, according to the nature of the topic;
3. In exploring each project, students would take the help of the teacher or teachers that they might choose from among the teachers competent to deal with it;
4. There will be no fixed oral classes but teachers may by agreement with their students arrange for oral classes as and when necessary, preferably in the afternoons;
5. The exact quantum of work to be covered by each student for his selected course cannot be determined, but in order to have completed his course, he should have shown regularity of sustained effort, development of capacities, understanding of his subject and the power of answering relevant questions orally and in writing with sufficient clarity and precision. "The quality of the work will be more important than the quantity of work, although the latter too should not be meagre, but commensurate with our high standards." (The Mother 1978, pp. 178-9)

This method is in fact a group teaching method as the class size in case of the Centre of Education is very small.

The methods of teaching mentioned above are not exhaustive. "But to tell the truth, each teacher, drawing his inspiration from modern ideas, should discover the method which he finds best and most suited to his nature" (The Mother 1978, p. 182). Some of the strategies useful for the teachers are as follows :

- (a) More stress on student centered instruction (Greson 1988),
- (b) More stress on individualised approaches (Cross 1981, Dressel and Marcus 1982 and Dunkin and Barnes 1986),
- (c) More stress on self-directed learning (Oddi 1983),

- (d) Efforts to improve quality of instruction with the help of self-evaluation and feedback received from colleagues and students, and
- (e) Appropriate use of educational technology. □

REFERENCES

1. Abercombie, M.L.J (1979) *Aims and Techniques in Group Teaching*. 4th edition. Guildford : SRHE
2. Abrahams, M.R. and Ost, D H. (1978) Improving teaching through formative evaluation. *Journal of College Science Teaching*. 7,227-9
3. Aleaman, L.M. (1974) *The Usefulness of Student Evaluation in Improving College Teaching*. Urbana, Ill : Office of Instructional Resources, University of Illinois.
4. Anand, M.R. (1954) An approach to teacher education in India. *Education Quarterly* 6,281-9, December.
5. APEID (1976) Free progress system—an experiment in the education of the future. In *Inventory of Educational Innovations in Asia*. Bangkok : UNESCO Regional Office.
6. Bakhtiar, M. (1982) Towards a Typology of Lecturing Styles. Unpublished Ph.D. Dissertation. University of Nottingham. (*Dissertation Abstracts International* C, 45, 1, 9, Spring 1984)
7. Ballard, M., Reardon, I. and Nelson, I. (1984) Student and peer rating of faculty. *Teaching of Psychology* 13, 88-90.
8. Beard, R. (1975) *Teaching and Learning in Higher Education*. London : Penguin.
9. Berquist, W.H., Phillips, P and Quehl, G H. (1985) *Handbook of Faculty Development*. Washington D C : Danville Press.
10. Bligh, D.A. (1972) *What's the Use of Lecturing ?* 3rd edn. London : Penguin.
11. Bligh, D.A. (1980) *Methods and Techniques in Post Secondary Education*. Paris : UNESCO.
12. Boud, D. (1981) *Developing Student Autonomy in Learning*. London : Kogan Page.
13. Brown, G.A. (1975) *Lecturing and Explaining*. London : Methuen.
14. Brown, G.A. (1985) Lecture. In T. Hussey and T. Levine Postlethwaite (eds.) *The International Encyclopaedia of Education*, 2987-91. Oxford : Pergamon Press.
15. Brown, G.A. (1987) Lectures and lecturing. In M.J. Dunkin (ed.) *The International Encyclopaedia of Teaching and Teacher Education* ? 284-8. Oxford : Pergamon Press.
16. Brown, P. et al (1973) *Creative Teaching in the College Classrooms*. Los Angeles : Creative Teaching Information Centre, University of California.
17. Brubacher, J. S. (1977) *On the Philosophy of Higher Education*. San Francisco : Jossey Bass.
18. Case, C.L. (1980) Impact of audio-tutorial laboratory instruction in biology on student attitudes. *American Biology Teacher* 42, 121-3, February.
19. Centra, J.A. (1977a) The how and why of evaluating teaching. *New Directions in Higher Education* 17, 93-106.
20. Centra, J.A. (1977b) Student ratings of instruction and their relationship to student learning. *American Educational Research Journal*, 14, 17-24.

21. Cockburn, B. and Ross, A. (1978) *Teaching in Higher Education*. No. 8 : Essays. Lancaster : University of Lancaster.

22. Collier, K.G. (1980) Peer group learning in higher education. *Studies in Higher Education* 5, 55-62.

23. Conard, C.F. (1982) Undergraduate instruction. In H.E. Mitzel (ed) *The Encyclopaedia of Educational Research* 5th edition 1963-73. New York : Free Press

24. Costia, F. (1972) Lecturing versus other methods of teaching : a review of research. *British Journal of Educational Technology* 3, 4-31.

25. Cranton, P.A. and Hillgartner, W. (1981) The relationship between student ratings and instructor behaviour : Implications for improved instruction. *Canadian Journal of Higher Education* 11, 73-81.

26. Cross, K.P. (1976) *Accent on Learning: Improving Instruction and Reshaping the Curriculum*. San Francisco : Jossey Bass.

27. Cross, K.P. (1981) *Adults as Learners*. San Francisco : Jossey Bass.

28. Davis, R.H. (1977) Learning by design. *New Directions in Higher Education* 17, 17-31.

29. Desai, S.D. (1975) The Teaching of English as a Library Language in the Commerce and Science Faculties of Universities in Gujarat. Unpublished Ph. D. dissertation. Gujarat University. In M.B. Buch (ed) *Second Survey of Research in Education*, p. 517. Baroda : Society for Educational Research and Development, 1979.

30. Doyle, K.O. Jr. and Whately, S.E. (1974) Student ratings as criteria for effective teaching. *American Educational Research Journal* 11, 3, 259-74.

31. Dressel, P.L. and Marccs, D (1982) *On Teaching and Learning in College*. San Francisco : Jossey Bass.

32. Dunkin, M.J. and Barnes, J (1986) Research on teaching in higher education. In M. Wittrock (ed.) *Handbook of Research on Teaching* 3rd edn. 754-79. New York : Macmillan.

33. Easton, G. (1982) *Learning from Case Studies*. New York : Prentice Hall.

34. Eble, K.E. (1972) *Professors as Teachers*. San Francisco : Jossey Bass.

35. Eble, K.E. (1984) *The Craft of Teaching*. San Francisco : Jossey Bass.

36. Edwards, J, Morton, S., Taylor, S., Weiss, M. and Dusseldorp, R. (1975) How effective is CAI ? a review of the research. *Educational Leadership* 33, 147-53.

37. Entwistle, N. (1981) *Styles of Learning and Teaching : An Integrated Outline of Educational Technology for Students, Teachers and Lecturers*. New York : Wiley.

38. Flechsig, K. (1979) On instructional models and their cataloguing. *Education* (Federal Republic of Germany) 19, 7-23.

39. Flynn, E. and La Faso, J.F. (1972) *Group Discussions as Learning Process*. New York : Paulist Press.

40. Ford, N (1981) Recent approaches to the study and teaching of 'effective learning' in higher education. *Review of Educational Research* 51, 345-77.

41. Frederick, P.J. (1986) The lively lecture-8 variations. *College Teaching* 34, 43-50.

42. Frey, P. W., Leonard, D.W. and Beatty, W.W. (1975) Student ratings of instruction : validation of research. *American Educational Research Journal* 12, 435-47.

43. Gage, N.L. (ed.) (1976) *The Psychology of Teaching Methods*. Chicago : University of Chicago Press.

44. Gagne, R.M. (1974) Educational technology and the learning process. *Educational Researcher* 3, 1, 3-8.

45. Gall, M.D. and Gall, J.P. (1976) The discussion method. In N.L. Gage (ed.) *The Psychology of Teaching Methods*. Chicago : University of Chicago Press.

46. Glass, G.V. (1974) Teacher effectiveness. In M. Wahlberg (Ed.) *Evaluating Educational Performance*. Berkeley, Ca : McCutchan.

47. Goldschmid, B. and Goldschmid, M.L. (1974) Individualising instruction in higher education : a review *Higher Education* 3, 1, 1-24.

48. Goldschmid, M.L. (1978) The evaluation and improvement of teaching in higher education. *Higher Education* 7, 221-45.

49. Goldschmid, M.L. and Goldschmid, B. (1976) Peer teaching in higher education : a review. *Higher Education* 5, 9-33.

50. Goodlad, J.L. (1971) Education and technology. In S.C. Techton (ed.) *To Improve Learning : An Evaluation of Instructional Technology* Vol. 2. New York : R.R. Bowker.

51. Gonzalez, C.M. (1988) Faculty opinions and practices of Media Utilization in the Six Regional Colleges of the University of Puerto Rico and the Factors Influencing its Use- A Case Study. Unpublished Ed. D. dissertation Indiana University, 1987. *Dissertation Abstracts International* 48, 9, 2252-A, March.

52. Greeson, L.E. (1985) Cumulative (personal) record : a case history in self-directed learning. *Lifelong Learning* 9, 21-23.

53. Greeson, L.E. (1986) Effects of individualised non-text oriented teaching on nontraditional college student learning. *Journal of Humanistic Education and Development* 25, 50-7.

54. Greeson, L.E. (1988) College classroom instruction as a function of teacher and student centered instruction. *Teaching and Teacher Education* 4, 4, 305-15.

55. Grubb, R.E. and Selfridge, L.D. (1963) Computer tutoring in statistics. *Computer and Automation* 13, 3, 20-26.

56. Gupta, B.C. (1982) Evaluation of the Innovative Practices of Teaching in Colleges of Education. Unpublished Ph.D. dissertation. Nagpur University. In M.B. Buch (ed.) *Third Survey of Research in Education*, p. 807. New Delhi : NCERT, 1986.

57. HMSO (1964) *Report of the Committee on University Teaching Methods (Hale Report)*. London : HMSO.

58. High, R.V. (1988) The Importance of various Teaching Characteristics as Perceived by Undergraduate College Students. Unpublished Ph. D. dissertation. Hofstra University, 1987. *Dissertation Abstracts International* 49, 4, 743-A, October 1988.

59. Hilderbrand, M., Wilson, R. et al (1988) *Evaluating University Teaching*. Berkeley, Ca : Centre for Research in Higher Education.

60. Jamison, D., Suppes, P. and Wells, S. (1974) The effectiveness of alternative instructional media : a survey. *Review of Educational Research* 44, 1-67.

61. Jaques, D. (1987) Group teaching. In M. J. Dunkin (ed) *The International Encyclopaedia of Teaching and Teacher Education*, 288-89. Oxford : Pergamon Press.

62. Joshi, D.C. (1979) A survey of university teaching methods. In Buch, M.B. (ed) *Second Survey of Research in Education*, p. 580-1. Baroda : Society for Educational Research and Development.

63. Joshi, S. M. (1986a) Teaching through discussion methods in higher education. *University News* 24, 11-14 January 16?

64. Joshi, S.M. (1986b) Effective lecturing at the university level. *University News* 24(45) 3-6 and 12, December 1.

65. Joshi, S.M. (1987) Professional preparation of university teachers. *University News* 25(50) 33-36, December 14.

66. King, P.G (1987) Development and evaluation of CAI lessons for use in macro economic theory. *CICA Faculty Newsletter* April 30.

67. Kozma, R., Velle, L. and Williams, G. (1978) *Instructional Technology in Higher Education*. Englewood Cliffs, NJ : Educational Technology Publications.

68. Kulick, J.A. and McKeachie, W.K. (1975) The evaluation of teachers in higher education. In F.N. Kerlinger (ed.) *Review of Research in Education*, Vol. 3. Itasca, Ill : PE Peacock.

69. Lee, C. (ed) (1967) *Improving College Teaching*. Washington D.C. : American Council of Education.

70. Lenhart, V. (1981) The initial and in-service training of university teaching staff-plans and problems. *Education* (Federal Republic of Germany) 24, 48-51.

71. Levison-Rose, J. and Menges, R.J. (1981) Improving college teaching : a critical review of research. *Review of Educational Research*, 51, 403-34

72. Lucio W.H. (1973) Pupil achievement as an index of teacher performance. *Educational Leadership* 7, 71. 7.

73. Mackenzie, N., Eraut, M. and Jones, H. C. (1970) *Teaching and Learning : An Introduction to New Methods and Resources in Higher Education*. Paris : UNESCO.

74. Marsh, H.W., Fleiner, H. and Thomas, C.S. (1975) Validity and usefulness of student evaluation of instructional quality. *Journal of Educational Psychology* 67, 833-9.

75. McKeachie, W.J. (1970) *Research on College Teaching : A Review*. (AAHE/ERIC Higher Education Research Report No. 6). Washington D.C. : ERIC Clearinghouse on Higher Education.

76. McKeachie, W.J. (1978) *Teaching Tips : A Guidebook for the Beginning College Teacher*. 7th edition. Lexington, Mass : D.C. Heath.

77. McLeigh, J. (1976) The lecture method. In N.L. Gage (ed.) *The Psychology of Teaching Methods : 75th Yearbook of the NSSE Part I*. Chicago : University of Chicago Press.

78. Miller, R. J. (1982) *Evaluating Faculty Performance*. San Fransisco : Jossey Bass.

79. Ministry of Education (1949) *Report of the University Education Commission 1948-19*. New Delhi : Govt. of India.

80. Mohanty, S.B. (1989) Training for college teachers. *Journal of All India Association for Educational Research* 1, 1, 9-20 and 29-34, February.

81. The Mother (1978) *Collected Works of The Mother*, Vol. 17. Pondicherry : Sri Aurobindo Ashram.

82. Murray, H.G. (1983) Low inference classroom teaching behaviour and student ratings of college teaching effectiveness. *Journal of Educational Psychology* 75, 138-49.

83. Murray, H.G. and Lawrence, C. (1980) Speech and drama training, for lecturers as a means of improving university teaching. *Research in Higher Education* 13, 73-90.

84. Oddi, L. (1983) The lecture : an update. *Adult Education Quarterly* 33, 222-9.

85. Orpen, C. (1988) Evaluation and improvement of university teaching. *Journal of Higher Education* 13, 1-3, 47-62, Monsson-spring.

86. Peterson, P.L. and Walberg, H.J. (ed.) (1979) *Research on Teaching : Concepts, Findings and Implications*. Berkeley, Ca : McCutchan.

87. Post lethwait, S.N., Novak, J. and Murray, H.T. (1972) *The Audio-Tutorial Approach to Learning Through Independent Study and Integrated Experiences*. 3rd edn. Minneapoils : Burgess.

88. Postman, N. and Weingartner, C. (1969) *Teaching as a Subversive Activity*. London : Penguin.

89. Pratt, A. Conard, C. (1969) Every man's undergraduate curriculum : a question of humanistic context. *Liberal Education* 67,2.

90. Rai, U.C. (1982) A study of the objectives, courses and methods of teaching followed at undergraduate level social sciences. Unpublished Ph. D. dissertation. Banaras Hindu University. In Buch, M.B. (ed.) *Third Survey of Research in Education*, p. 558. New Delhi : NCERT.

91. Raza, M and Fernandes, M. (1988) Functions of teachers in higher education. *Journal of Higher Education* 13, 1-3, 3-27, Monsson-spring.

92. Rogers, C (1983) *Freedom to Learn for the 80s*. Columbus : O.H. Merrill.

93. Rogers, J. (1977) *Adults Learning*. Milton Keynes : Open University.

94. Rose, C. (1976) Stalking the perfect teacher. *Chronicle of Higher Education* 8,5,24.

95. Rushton, J.P. Murray, H.G. and Paunonen, S.V. (1983) Personality, research creativity and teaching effectiveness in university teaching. *Scientometrics* 5,93-116.

96. Ruskin, R.S. (1974) *The Personalized System of Instruction : An Educational Alternative*. AAHE/ERIC Higher Education Research Report No. 5) Washington D.C. ERIC Clearinghouse on Higher Education.

97. Shaffer, J. and Galinsky, M. (1974) *Models of Group Therapy and Activity Training*. Englewood Cliffs : Prentice Hall.

98. Shah, A. B. (1969) *Modernlization of University Teaching : Natural and Social Sciences*. Bombay : Nachiketa Publications.

99. Shah, B. (1988) New technologies vs. lecture tradition in higher education. *University News* 26 (49-54). December 5.

100. Simpson, R.J. (1966) *Teacher Self Evaluation*. London : Macmillan.

101. Singhal, S. (1988) Effective teachers—how good is the student consensus ? *Journal of Higher Education* 13, 1-3, 101-8, Monsoon spring.

102. Smith, A.B (1976) *Faculty Development in Higher Education* (AAHE/ERIC Higher Education Research Report No 8). Washington D.C. : ERIC Clearinghouse on Teacher Education.

103. Smith, D.G. (1977) College classroom interaction and critical thinking. *Journal of Educational Psychology* 69,2, 180-90

104. Smith, P.B (1980) *Small Groups and Personal Change*. London : Methuen

105. Sri Aurobindo (1972) *Sri Aurobindo Birth Centenary Library Volume 17*. Pondicherry : Sri Aurobindo Ashram.

106. Stein, M.I. (1975) *Stimulating Creativity : Vol. 2 : Group Procedures*. New York : Academic Press.

107. Sullivan, A.M. and Skanes, G.R (1974) Validity of student evaluation of teaching and characteristics of successful instruction. *Journal of Educational Psychology* 66, 584 90

108. University Teaching Methods Unit (1978) *Improving Teaching in Higher Education*. London : University of London, Institute of Education.

IMPORTANT PUBLICATIONS OF PUNJABI UNIVERSITY

1. Sri Guru Granth Sahib Vol, I,II,III	by Gurbachan Singh Talib (tr.)	160-00 (each volume)
Sri Guru Granth Sahib (completed in 1604) is the sacred scripture of the Sikh faith and is looked upon as inspired word of God. The last and fourth volume is underprint.		75-00
2. Folk Art of the Punjab	by Harjeet Singh Gill Picturization of Punjab's Culture and Folk Art with twelve full page multi-coloured and forty two B/W plates.	100-00
3. A Phulkari from Bhatinda	by Harjeet Singh Gill Contains legendary art of embroidery of Bhatinda conspicuously and metaphysically narrated with thirty five full page multi-coloured plates.	1500-00
4. Agricultural Planning Atlas of Punjab	by G.B. Singh This Agricultural Planning Atlas of Punjab presents a comprehensive selection of maps and statistical information organized under topical headings to depict important aspects of agricultural development in Punjab and their underlying dynamics covering the past three decades (1951-81)	20-00
5. Spirit of Oriental Poetry	by Puran Singh Puran Singh's 'The Spirit of Oriental Poetry' deals not only with the poetry of Sikh Gurus but also of Bhaktas and Jai Deva, the author of the Gita Govinda and Persian Poets like Omar, Hafiz and Shamas Tabriz.	80-00
6. A Bibliography of the Punjab	by Ganda Singh The aim of the present bibliography is to put together in one volume information about the material on the history and culture of the Punjab available in Indian and foreign languages lying scattered in current books as also in rare and out of print books and periodicals and in rarer manuscripts preserved in libraries in India and abroad.	20-00
7. Glimpses of Ancient Punjab	by Buddha Prakash Almost all the turns of Indian History took place in North India resulting from the conflicts of invaders and the native people.	10-00
8. Evolution of Heroic Tradition in Ancient Punjab	by Buddha Prakash The learned author has dealt with the topic of heroic age from Vedic age to Kushana period dealing Bhagvadgita, Mahabharata, Achacmenian challenge, Macedonian invasion and Maurya and Sunga empires.	35-50
9. Deporation of Lala Lajpat Rai and Sardar Ajit Singh	History of the Freedom Movement in the Punjab (Vol. IV) by Ganda Singh (ed.) This book comprises 216 confidential notes, letters report referring to speeches and actions of both the leaders which have become source of nuisance for the British rulers resulting in the issuance of warrants and deportation of Lala Lajpat Rai and Sardar Ajit Singh.	40-00
10. Seditious Literature in the Punjab	History of Freedom Movement in the Punjab (Vol. V) This book deals with the literature which was considered by the British Government as inflammatory and threat to the STATE. The well-known personalities of this book are revolutionaries who worked in the Punjab.	22-50
11. Who's Who—Punjab Freedom Fighters (Vol. I)	by Fauja Singh (ed.) This volume indicates the dimensions which the freedom fighters in the Punjab assumed. This volume series A-I includes more than 34,000 names of patriots who actively participated in the struggle for freedom, out of whom newly 2000 laid down their lives in the service of national cause. This project has great historical significance.	11-00
12. Eminent Freedom Fighters of Punjab	by Fauja Singh This volume, contains life-sketches, in brief, of ninety two eminent freedom fighters drawn from different parts of the pre-1947 Punjab. It projects varied ideological currents ranging from refomation to revolution, from gun-barrel philosophy of terrorists to Gandhian non-violence, from aristocratic protests to peasant outbursts.	15-50
13. Punjabi Heroic Tradition (1900-1947)	by Satya M. Rai The author gives an authentic picture of the undaunted spirit of endurance shown by the Punjabis during eventual division of the Punjab which was no less heroic than the struggle for freedom.	7-50
14. Mahatma Gandhi and C.F Andrews-A Study in Hindu—Christian Dialogue	by K.L. Seshagiri Rao Here the writer explores the friendship of Mahatma Gandhi and C.F. Andrews as particularly relevant to what has been called "The dialogue" between the great religions of mankind.	20-00
15. History of Poros	by Buddha Prakash This book History of Poros is bases on original sources, Poros acquired so much power that his name and fame spread far and wide. Alexander the great, sent an envoy to Poros asking him to pay tribute but Poros refused.	60-00
16. The Articulatory and Acoustic Structure of the Panjab Consonants	by Balbir Singh Sandhu In this book the author has studied Punjabi consonants in a very great detail from both articulatory and acoustic angles. The study has made insightful generalisations regarding the characteristics of the special consonants, and their transitional properties in the structure of syllables.	147002

ASK FOR COMPLETE CATALOGUE OF BOOKS IN ENGLISH & PUNJABI
ALONGWITH TRADE TERMS :

PUBLICATION BUREAU, PUNJABI UNIVERSITY, PATIALA-147002

DISTANCE EDUCATION

Taxonomy of Courses, Educational Aims and Teaching Strategies

Beena Shah*

Introduction

A radical innovation in education was made by establishing the British Open University in 1969, which was based on use of recent teaching technology. Text, television and radio were the main media of delivery. The core courses were provided through the text materials, Television and Radio were to provide support for the texts. Now with the fast developments in technology there is a proliferation of new media which raises a number of issues. Are some media more effective than others? Should new media replace existing media or should they be used in addition to these? How should academic staff of open universities of the world be made aware of the potential and limitations of new media?

The three original media—text, television and radio—were not chosen by accident for the Open University. Virtually every home in England could be accessed through these media. Thus, no one in Britain should have been prevented from enrolling for the open university because of difficulty in getting the teaching material. But how the following two things have happened in the last 17 years? The principle of universal access regarding broadcasting at the Open University has been eroded, because not all students can watch or listen at the times at which programmes are broadcast. Secondly, most alternative media (Video-cassettes, cable TV, CAL, etc.) are not universally available in all the houses. The problem in India is more acute. Here even the television is not available to every part of the country. Should distance teaching institutions use those media which are not commonly available to all? Should students share the equipment available at the local study centres to reduce the costs? If so, to what extent should distance teaching be home-based or local centre-based?

Thus, the new problem to educationists posed by advancement in educational technology, is to decide which teaching methods and channels of communication are to be used in order to achieve a given set of

educational aims. This question does not simply relate to new ways of teaching traditional subjects, it relates to kinds of audience, different kinds of subject matter, different kinds of courses, different forms of access to education, as well as to different study patterns amongst those who want to learn. The use of distance teaching methods to facilitate the education at home brings into consideration all those students who would not, or could not, attend full-time or evening classes, as well as the many different kinds of courses they might want to take. Distance teaching methods, as compared to the more traditional face-to-face teaching, involve quite different costs in terms of both money and manpower. Similarly, the costs for students in terms of money and time are very different.

The purpose of the present paper is to discuss how to choose appropriate technology for distance education? All the factors discussed above can be taken into account only after designing the successful course contents. This paper mainly concentrates on the pedagogy part, including the problem of motivation of both students and teaching staff. Other factors such as costs and access have been considered earlier (Shah, 1986; 1987). The main aim is the provision of specific courses or materials of one kind or another, rather than the various forms of student centred open learning systems which now exist. Efforts have been made to discuss how best to achieve successful teaching at a distance, assuming that the students are motivated to learn, have access to the courses they want, and can afford what they cost. This has also been compared with such courses as the more traditional face-to-face teaching provided by Universities and Colleges.

Within the confines of pedagogic considerations, there are five main dimensions to the specification of courses for all types of education. These are:

- (a) The subject matter (e.g. physics, chemistry, etc.)
- (b) The type of course or material (e.g. academic, practical, etc.)
- (c) The level (e.g. undergraduate, postgraduate, adult, etc.)

*Department of Education,
Rohilkhand University,
Bareilly-243 001.

- (d) The method of presentation (e.g., face-to-face, TV, text).
- (e) Students' study patterns (home based, work based, verbal, visual, slow or quick on the uptake, etc.)

Traditional universities have been clear about where they stand on each of these factors. As regards subject matter the range of academic subjects offered has a strong traditional academic core with a few more recent innovations added on to it. The subject titles change only slowly, even though the content of each subject might well change considerably. Universities have created strong demarcations between one subject and another so that subjects are difficult to encompass. Also university courses are in the main academic subjects for undergraduate & postgraduate students. The more practical subjects/professional courses like medicine and engineering seem to be accepted in a few traditional campuses. These are taught in the colleges specifically meant for them.

As regards presentation and study patterns, it is taken almost for granted that lecturing, tutorials, and laboratory work are the main components of the activities by which students are expected to learn. This presents reasonable variety of methods and so caters quite well to variations in students' learning methods and study techniques. None of these methods however, transfers directly into the field of distance education although a comparable variety is likely to be needed for some kinds of courses.

At present higher, advanced and continuing or especially such type of education which involves teaching at a distance, demands a widening of the field in all directions beyond that occupied by university courses. Further, the capabilities and limitations of different teaching methods, especially those using advanced technology, depend very much upon the subject matter to be taught.

Section 2 is devoted to make a number of distinctions between different kinds of courses. The educational strategies and methods appropriate to each kind of course are discussed in Section 3. Section 4 deals with aspects of the problem of ensuring the quality of teaching. Conclusions are drawn in Section 5.

II

Specification of Courses

In this section the various dimensions of course specification referred to above are discussed in turn.

Subject Matter

In every institution the teaching style, the type of course, its level and the need to attend college have been more or less standard. Most students have registered for the purpose of obtaining qualifications in a particular Course.

Nowadays, in distance teaching, naming the subject is only a part of the matter, even though it is a very important part. The variety of types of audience, and the greater opportunities for access they have, brings about a demand for a much wider range of subject matter, from professional courses through academic and practical courses to community interest courses. Evidently courses aimed at examinations are very different from general interest courses, and this fact is reflected in the topics offered. Thus the title or subject matter of a course needs to be accompanied by a syllabus, to show the area covered, together with educational aims or objectives to indicate the type of courses and the depth to which each topic is taught.

Types of Courses

Most of the universities place teaching "students to think" high on their list of educational aims. Therefore, much of university education is directed, in one way or another, towards this rather imprecise cognitive aim. But even this has different aspects to it, ranging from intellectual skills, like analysis and design, to making rational decisions and solving problems. The teaching strategies appropriate to each cognitive aim are not in general the same, so the methods to be used to achieve them have to be carefully chosen. So "the ability to think" is a portmanteau phrase that needs to be broken down.

Its main ingredients seem to be "understanding" and "intellectual skills". Learning to understand is concerned with conceptual development, becoming familiar with new concepts, and the words used to refer to them and with being able to explain events in terms of these concepts. Intellectual skills on the other hand are concerned with applying knowledge and understanding to practical problems of one kind or another. So "thinking" is being able successfully to apply one's understanding to new situations.

The implication of this is that "knowledge" (e.g. of facts or processes) is a different cognitive category from "understanding" and should be kept apart from it. Whilst it is possible to know the actions

appropriate to given situations, it is not possible to know about new situations. These require thought. Understanding provides the framework or structure of knowledge, a kind of interconnected matrix of conceptual elements or pigeon holes. Knowledge is what these pigeon holes contain. Indeed it is very important to appreciate that knowledge can only be acquired if some measure of understanding already exists—even if this is only being able to understand everyday language. Specific knowledge presupposes some specific understanding.

There have been several taxonomies of educational aims, beginning with Bloom's classic work (1956), but for the purpose of this article let us distinguish between three kinds of learning in the cognitive domain, namely knowledge, understanding and intellectual skills. These three ingredients, however, can be combined in different ways to produce different sorts of courses in the cognitive domain, all of which are of particular relevance to adult education.

There are two further kinds of educational aims which must be remembered, namely manual or motor skills (ranging from tennis to typing) and learning in the affective domain; that is, learning attitudes (such as diligence, tolerance, flexibility of thought, etc.) and values (in such fields such as aesthetics, politics, social sciences, etc.). For the moment, the concentration is on courses within the cognitive domain.

A number of terms are being used nowadays to describe different kinds of courses. In terms of the three educational aims listed above these courses can be given more precise meanings. Some of them are:

<i>Kinds of Courses</i>	<i>Mainly concerned with</i>
(a) awareness courses	knowledge
(b) training courses	skills
(c) academic courses	understanding in specific areas
(d) updating courses	knowledge with different levels of prior understanding

Table 1: Types of Courses

An updating course is best thought of as a course for a specialist or professional (e.g. a doctor or engineer) whose knowledge has not kept pace with development, but whose understanding of the specialism remains. So an updating course is mainly factual but only comprehensible to the appropriate

specialist. An awareness course is also factual but is intended to inform people in fields outside their specialism, and so must be in a language which is comprehensible to non-experts. Thus 'assumed entry behaviour' is a fourth important factor to be taken into account in the design of a course. A better phrase for this would be 'assumed prior understanding'.

Assumed prior understanding also makes the difference between upgrading courses and the so-called interface courses. Both courses aim to increase the knowledge and understanding of the students but do not aim to produce skilled practitioners. But upgrading courses are intended to extend a students' understanding of their specialisms, while interface courses are intended to develop understanding in areas outside their specialism. For example, interface courses are for managers and supervisors who have to work intelligently with practitioners. So the two types of courses, even if they are dealing with the same subject, must differ greatly because of the prior understanding in the students that can be assumed.

Figure 1 (on next page) represents these distinctions between types of courses. It shows a greatly simplified model of the differences between them but is nevertheless a very helpful guide.

Level

The concept of level applies primarily to academic courses, and refers, essentially, to the depth of understanding being taught. Since other types of courses also teach understanding it applies rather more closely to them too.

Again, a simple model of what is meant by depth of understanding is helpful. Understanding means familiarity with the general principles and concepts of a subject. Three levels are worth distinguishing. At the most superficial level are simple generalisations about objects and events (e.g. all bodies tend to fall, all 'workers' vote Congress). There are usually exceptions to every generalisation, (including this one). At a deeper level there are theories about, and explanations of, these generalisations, often in terms of abstract concepts (such as gravitation, equality, freedom, etc.). Note that explanation can take many forms: causal, historical, teleological, etc. At the deepest level lie theories about the interrelationships between abstract concepts. Thus, in general, in the academic hierarchy, 10 level, 10+2 level, undergraduate level and postgraduate level refer to a progressive deepening of understanding.

III

Educational Strategies and Methods

Before considering the educational strategies appropriate to the three main ingredients of courses, namely knowledge, understanding and skills, we must first consider the concept of feedback.

Feedback

The main purpose of feedback, whether in education or in engineering or elsewhere, is to remove error from the overall operation of the system, and to ensure that progress is being made in the required direction. Deviations and errors in learning can occur for a variety of reasons. For example, the teacher may make mistakes or be misleading; the transmission method (e.g. printing, telephone, computer, TV, etc.) may be faulty and noisy; students' abilities and prior understanding vary so that some

may misunderstand or forget quite clear instructions and explanations. Feedback can be between student and teacher, among students themselves or between student and computers. If properly used it can correct or at least detect many of these errors. So in general feedback methods are needed in education. As we shall see, however, the form of feedback should differ considerably.

The Teaching of Knowledge

Knowledge is easy to present but is learnt only by those who are motivated to learn, who have good memories (e.g. not too old), and who have acquired sufficient prior understanding to make sense of the information being offered. Specialist knowledge in, say, medicine or engineering, requires appropriate academic courses as pre-requisites. Motivation is rarely a problem in adult education. Students who undertake courses in their spare time usually want to learn. It is quite a different matter in full time

THE COGNITIVE CONTENT OF DIFFERENT TYPES OF COURSES

The assumed prior understanding in the subject being taught
is represented by L, M & S.

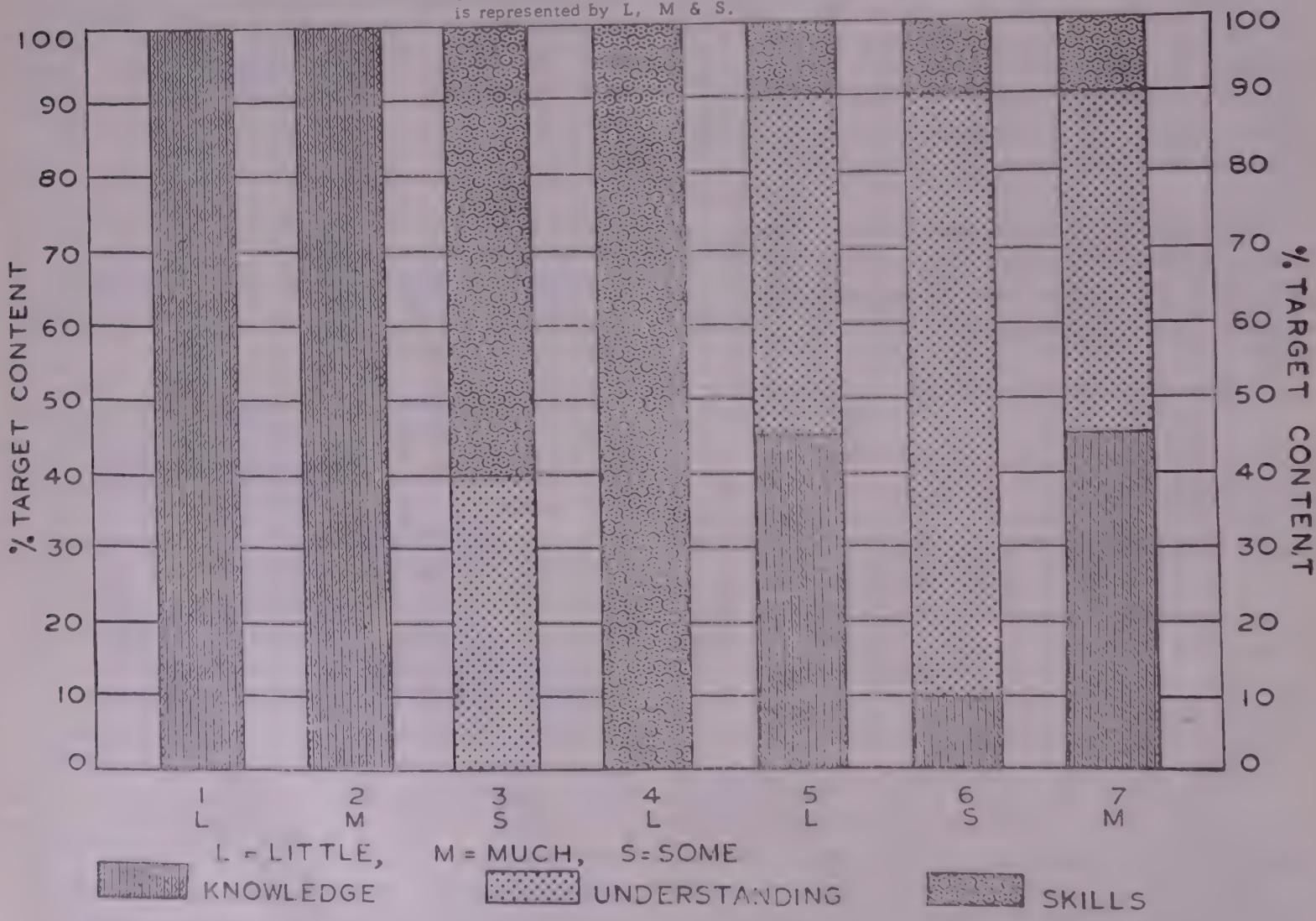


FIG. 1 Training Awareness Updating Practitioner Interface Academic Upgrading

secondary or tertiary education when students are expected to learn. For the latter it may be necessary to make the teaching "relevant" or "interesting". With adults it needs only to be effective, since it is already relevant and interesting.

The method of presentation should match the kind of knowledge being taught, though each method must be supported by appropriate verbal descriptions, either spoken or written. So, for example, when the information to be conveyed is known and agreed, the appropriate method of presentation for different types of knowledge are shown in the Table 2.

Methods of Presentation

	<i>Types of Knowledge to be given</i>
(i) Television, films, slides, etc.	Natural History, architecture, etc.
(ii) Printed material, computers (teletext)	Numerical data, lists, etc.
(iii) Audio tapes	Music, Language, etc.
(iv) Audio-visual, cyclops, computer terminals	Engineering, design, Science

Table 2 : Methods of Presentation of Knowledge

These media are satisfactory for awareness courses, but are not sufficiently interactive for updating courses. Students who already possess a good deal of specialist knowledge and understanding often need to ask questions of their expert teachers, and to explain their particular problems. For example, doctors might need to describe a particular set of symptoms before expert advice on the latest diagnosis and treatment can be given :

- for such "question and answer" sessions use telephone conferences, TV or radio phone-ins, face-to-face classes, or expert (computer) systems.
- for information on request use encyclopaedia (or other forms of printed information), teletext or Dia Access.

The Teaching of Understanding

There are two basic strategies to use in teaching understanding : the use of redundancy; the use of discussion; or both. Either method achieves the all-important necessary operation of driving the new concepts and thought processes through the learner's mind several times and in different contexts. Understanding, unlike knowledge cannot be learnt by heart; it needs a much deeper mental grasp.

The use of redundancy simply means teaching the same ideas in several different ways: for example, analysing them in terms of other concepts, by analogy, by applying them in different contexts, by contrasting them with alternative ideas, by repetition but in different words, by the use of different media, etc.

The use of discussion involves clarifying the ideas and concepts, once they have been presented, through discussion with other students, with a tutor or teacher, with a computer programme, even with oneself (through self-assessment questions), by tackling problems and, where necessary, by reference to textbooks.

These strategies are not exclusive alternatives. Obviously aspects of each can be welded together in effective courses of several cost-effective kinds. The following are some examples :

(i) Traditional University/College Face-to-Face Teaching

This involves tutorials, library consultation, student interaction, lab-work in addition to lectures. Note that lectures are often regarded as a basic teaching method. They teach knowledge and sometimes they teach in the affective domain, but they only provide one component mainly as a discussion based strategy for teaching understanding. Most of the learning of understanding takes place outside the lecture theatre. The lectures are mainly explanatory statements of what has to be learned; the learning occurs in the "mulling over" that follows. Thus universities present their courses using a mixture of strategies; redundancy is provided by lectures, libraries and labs. Discussion is encouraged by residential accommodation and tutorials and small group teaching. The lectures play quite a small part in the learning process. The discussion strategy is applied in its purest form in good school teaching. Here, the classroom is the place where learning takes place. Homework concentrates on intellectual skills. Far more time is spent in school classrooms however than is spent in university lectures.

(ii) Multimedia Teaching, and The Open University

Difficult concepts are best taught using several selected appropriate media, from (i) Structured teaching text; (ii) TV (preferably on cassettes); (iii) audio cassettes with or without visual additions (e.g. Cyclops); (iv) home kits. This use of redundancy can be augmented in distance teaching by discussion

strategies, using telephone conferences, face-to-face tutorials and tutored video instruction. As the function of learning, teaching understanding is often misunderstood. It is often regarded as remedial in the sense that its purpose is to correct or reveal students' misunderstandings. Tutorials, of course, achieve this to some extent but not very efficiently. Misunderstandings and errors in learning are normally very personal, so they are not well dealt with in a group if everyone's time is to be well spent. (Individual errors are best dealt with by individual attention, often quite brief, by a tutor or a fellow student). The tutorial or teleconference, in teaching—understanding, should be regarded as a way of teaching through discussion, rather than remedial.

(iii) Tutored Video Instruction (TVI)

This method involves the playing of a video-taped lecture to a group of students but with many interruptions to allow discussion of the topics being presented. The taped lecture states in orderly and explanatory manner what has to be understood; much of the learning takes place during the frequent discussion sessions into which the taped lecture is broken down. The tape is a guide and a source; text-books, the tutor and other students provide the discussion of the ideas in different contexts and so bring about the learning. Alternative guides to study and sources of material, such as structured text or audio tapes do not provide the same rich focus for common student experience as a video tape does. For TVI to be appropriate it is essential that distance students are able to assemble frequently in small groups with a tutor. It is not a home-based learning method at least not until some advances in information technology have been made to allow simultaneous viewing and interruption of TV tapes in students' homes.

Note that it is part of the strengths of the first two methods that they can be used for teaching knowledge and for demonstrating skills, as well as for teaching understanding. TVI is more limited, but for teaching understanding at a distance it is an almost ideal use of the discussion strategy.

The three methods (face-to-face teaching, multimedia teaching, and TVI) are what might be regarded as pedagogically optimal, but none of them is cheap. The first and third are expensive in manpower where large student numbers are involved, since costs increase with student numbers. The second is expensive in production so becomes cheaper per student as student numbers increase. Less expensive methods

can also be fairly effective—depending a good deal on student motivation, and on subject matter. For example successful courses that teach some understanding as well as knowledge or skills can be taught by :

- (a) highly structured teaching texts on their own;
- (b) teaching text and home kit (e.g. microprocessors);
- (c) television and radio (e.g. economics); and
- (d) audio vision or Cyclops (e.g. mathematics) on its own.

The Teaching of Skills

The teaching of skills consists of two parts, and, in principle is quite straightforward, although the implementation of the second part in distance teaching is quite difficult.

The first part comprises instruction and demonstration. For this, video tape is the most versatile, and for any skill with a manual component (even doing mathematical calculations) it is probably the most effective method. This is even more effective than face-to-face demonstration owing to its replay capability. Seeing someone doing what has to be done always communicates best. However it is expensive. Less expensive but effective methods include :

- (a) audio vision for mathematics, engineering, science;
- (b) instruction books for most skills;
- (c) computer aided instruction for problem solving, simulations and calculations; and
- (d) audio tapes and books for languages, interpersonal skills, etc.

The second part consists of providing students with opportunities to practice their skills and to have their work monitored. This is difficult to achieve whenever student number is large, particularly so in distance teaching. For particular purposes the following are effective :

- intellectual skills that result in written work can be handled by correspondence;
- if responses are sufficiently well codified they can be tirelessly monitored through CAL programmes, with a tutor's help called up by telephone when needed;
- audible skills (including music) can be observed and corrected by telephone conferencing;
- a number of intellectual skills, such as elect-

ronic circuit design, can be self-checked by the application of standardised test procedures. Indeed, before long, home-based microcomputers will be able to simulate many electronic signal processes so that self-checking of circuit performance characteristics could become highly sophisticated;

— many, more practical, skills, however, require face-to-face supervision and so, at least until home-based two-way television transmission using the cable network is available, are not suitable for distance teaching.

Teaching in the Affective Domain

Probably the only fairly well understood "teaching" activity in the affective domain is advertising or salesmanship. Its role in education might be to convey to students the importance or delights of particular courses of fields of study, or, in other words, to increase students' motivation to study, though motivational factors to study and work long hours usually lie too deep to be much affected by any sensory inputs.

Generally, television seems to be the most effective form of communication for affective teaching, although writing and lecturing (or public speaking) can also be successful. The essence of the process seems to be to appeal to the emotions as well as to the intellect. The ability of television to show disturbing aspects of reality gives its extra strength, even as evocative writing.

Much affective teaching however emerges with time over long periods of study, especially for degrees or other qualifications. The activity of study develops habits of diligence, self-reliance, etc., and so changes students' attitudes and values. But these changes occur as by-products of the teaching. They are rarely the overt educational aims.

IV

The Quality of Teaching and Teacher Motivation

If technology can make study more acceptable and convenient to students, it may not be able to do the same for teachers. Yet it is essential, in the long term, even if not initially, when enthusiasm to experiment is high, to ensure that the methods used are supported by the teachers who have to use them. So a further factor in education is the problem of ensuring that teachers feel that their time is well spent using educational technology, and that good quality materials and effective teaching is achievable.

An important parameter affecting both these characteristics is the number of the teacher's man-hours spent in generating one hour's worth of student work. Table 3 shows some representative figures including some teaching methods used for face-to-face teaching. The larger the student audience in each case the less expensive is the method per student taught. Some methods however are effective only with small student numbers.

Teaching Methods

Ratio of academic man-hours per student-hour of work generated

(i) Lecturing	2-10
(ii) Small group teaching	1-10
(iii) Video-tape lecturers (for TVI)	3-10*
(iv) Audio-vision	10-20*
(v) Teaching text	50-100**
(vi) Broadcast TV	100 or more**
(vii) Computer aided learning	200 or more*
(viii) Interactive video disc	300 or more**

Table 3 : Effective Use of Manpower

These data clearly have relevance to the cost of each system, but they are also of significance pedagogically. It may be mentioned here that educational methods that require very substantial investments of time by the teachers soon fall into disuse, once the initial pioneering zeal has passed unless there are extra motivations for keeping at it. Improved educational effectiveness may well not be enough to persuade teachers to spend 200 hours for each student hour (even if 1000 students benefit) when by using face-to-face methods only 2 to 10 hours would be needed. Effective motivations include (i) extra payment; (ii) seeing one's work in print—as with writing teaching texts; (iii) appearing on television programmes (effective with broadcast TV though not with video-cassettes). Without such extra incentives the quality of the teaching using technology is likely to fall away, or die, if too much time and effort is demanded of the staff when face-to-face teaching is so much easier.

V

Summing Up

This article does not mention the summary of what is known about educational technology but an attempt has been made to outline the understanding

*requires supporting staff.

**requires several supporting staff.

of a simple taxonomy of courses, educational aims and teaching strategies. The categorisations mentioned here are by no means the only ones possible, but they do provide a useful language and analysis by means of which it is possible to progress in consultation with others, from a course specification by students, both to a course structure and to an array of distance teaching methods that will be educationally successful for the particular course.

REFERENCES

Anderson, R.H. (1976) *Selecting and developing media for instruction*. New York : Van Nostrand Reinhold.

Atkinson, R.C., & Shiffrin, R. (1968) "Human memory : A proposed system and its control process". In Spence, K.W. & Spence, J.T. (eds.), *The psychology of learning and motivation : Advances in research and theory* (Vol. 2) New York : Academic Press.

Bates, A.W. (1982) "Learning from audio visual media" in *Student learning from different media in the open university Institutional Research review* No. 1.

Bates, A.W. (1980) "Towards a better theoretical framework for studying learning from television", *Instructional Science*, Vol. 9 No. 4.

Bloom, B.S. (1956) *Taxonomy of educational objectives : the classification of educational goals. Handbook 1 : Cognitive Domain*. New York : David McKay.

Bower, G.H., & Hilgard, E.R. (1981) *Theories of learning* (5th ed.) Englewood Cliffs, N.J. : Prentice-Hall.

Briggs, L.J., & Wager, W.W. (1982) *The handbook of procedures for the design of instruction* (2nd ed.) Englewood Cliffs, N.J. : Educational Technology.

Cronbach, L.J., & Snow, R.E. (1977) *Aptitudes and instructional methods*. New York : Irvington.

Dale, E.A. (1969) *Audiovisual methods in teaching* (3rd ed.) New York : Holt, Rinehard, & Winston.

Elstein, A.S. (1979) "Problem solving : applications of research to undergraduate instruction and evaluation." *Programmed Learning and Educational Technology*, Vol. 16, No. 4.

Estes, W.K. (1978) *Handbook of learning and cognitive processes*, Vol. 5 : *Human information processing*. Hillsdale, N.J. : Erlbaum.

Gagné, R.M. (1977) *The conditions of learning* (3rd ed.) New York : Holt, Rinehart, & Winston.

Gagné, R.M. & Briggs, L.J. (1979) *Principles of instructional design* (2nd ed.) New York : Holt, Rinehart, & Winston.

Gagné, R.M. & White, R.T. (1978) "Memory structures and learning outcomes". *Review of Educational Research*, Vol. 48.

Gropper, G.L. (1976) "A behavioural perspective on media selection". *AV Communication Review*, 24.

Holmberg, B. (1982) *Essentials of distance education*. Hagen : Fern Universität, Ziff.

Kemp, J.E. (1980) *Planning and producing audiovisual materials* (4th ed.). New York : Harper & Row.

Knapper, C.K. (1980) *Evaluating instructional technology*. London : Croom Helm.

Olson, D.R. (1976) "Towards a theory of instructional means". *Educational Psychologist*, Vol. 12.

Reiser, R.A. and Gagné, R.M. (1982). "Characteristics of media selection models". *Review of Educational Research*, Vol. 52.

Romiszowski, A.J. (1974) *The selection and use of instructional media*. London : Kogan Page.

Salomon, G. (1979) *Interaction of media, cognition and learning*. San Francisco : Jossey-Bass.

Schramm, W. (1977) *Big media, little media*. Beverly Hills, Calif. : Sage.

Shah, B. (1986), "Contribution of non-print media to promoting the cause of education," Workshop for the Handbook on Educational Journalism, Sept. 11-13, Udaipur, India.

Tosti, D.T. & Ball, J.R. (1969) "A behavioural approach to instructional design and media selection". *AV Communication Review*, Vol. 17.

JOURNAL OF RESEARCH ASSAM AGRICULTURAL UNIVERSITY

Journal of Research, Assam Agricultural University is published twice a year. Research papers on fundamental and applied research dealing with agriculture, veterinary, fishery and allied sciences are accepted for publication.

The papers published in this Journal are selectively abstracted and indexed in the recognised abstracting Journals and Reviews.

Subscription rates

Individual
Institutions, Libraries and Organisations

	Annual	Per copy
	Rs. 12.00	Rs. 6.00
	Rs. 16.00	Rs. 8.00

Please Contact :

The Assoc. Director of Publication & Information Directorate of Extension Education, Assam Agricultural University, Jorhat-785013

UNIVERSITY OF KASHMIR

A Profile

History

The present University of Kashmir takes its origin from the University of Jammu and Kashmir which was founded in 1948 as an examining and affiliating body in the State of Jammu & Kashmir. Immediately after its establishment, steps were taken to develop it into a full-fledged University to promote higher education and enrich the long standing tradition of learning in the State. Teaching programmes were started in 1956 with the establishment of three Postgraduate Departments; viz. Economics and Geology at Jammu and English at Srinagar. In 1958 three more Postgraduate Departments, Mathematics, Urdu and Hindi were set up at Srinagar.

Thereafter, the University of Jammu and Kashmir maintained a steady progress in terms of academic growth and expansion. New Departments and Research Centres were set up in order to provide educational facilities to students in the subjects of their choice, matching their aptitude and potentialities and to promote research in various disciplines. The growth of the university was rapid and, therefore, the University of Jammu and Kashmir was divided into two divisions: one in Jammu region and the other in Kashmir region with central unit as its apex body, coordinating the work of both the divisions.

Subsequently, on 5th September, 1969, the University of Jammu and Kashmir was bifurcated into two full-fledged universities—the University of Kashmir in Srinagar and the University of Jammu in Jammu. The University of Kashmir has now emerged out of its juvenile stage of growth into a phase in which consolidation is the main objective—there is a shift now from quantitative growth to perfection of quality. Qualitative improvement programmes are the main targets of the University.

The Calender of the University states, among other things, the objectives of the University as

"to provide for instruction in such branches of learning as the University may think fit, and to make provision for research and for the advancement and dissemination of knowledge".

The University of Kashmir is located at Hazratbal, just adjacent to the famous Muslim Shrine, "DARGAH" of Hazratbal. It is situated about 10 kms. from the city centre, Lal Chowk. The University Campus spread over an area of 225 acres of land is located between Nagin and Dal Lakes amidst delightful natural surroundings with the Himalayan mountains in the background; it includes the Nasim Bagh—a famous Mughal garden built by the emperor, Akbar the great.

The Crest of the University of Kashmir was thoughtfully designed; lofty in conception and beautiful in shape, it faithfully reflects the ideals and aspirations that inspired the founders of the Institution. It comprises two concentric discs: the inner containing the images of a Chinar Tree, an open book and a Mashal (torch) and between the concentric rings is inscribed the University motto. These famous quotations from the holy Quran and the sacred Vedas respectively signify the noblest of human aspirations—passage from "darkness to light", i.e., from the state of ignorance to that of knowledge and enlightenment. The figures of the book and the "mashal" signify the pursuit of knowledge as the hallmark of a seat of learning. The Chinar adds local colour and also symbolises the majesty and beauty of Nature, that is so bountiful in Kashmir.

University Council

The University Council is the highest body invested with powers to frame, amend and repeal statutes/regulations of the University, to make appointments of teachers and of officers of the rank of Registrar, Librarian and Controller of Examinations.

Syndicate

The Syndicate is the Chief Executive Body having authority over matters that do not directly fall within the jurisdiction of the University Council. It has powers to make appointments of Lecturers and Officers below the rank of Registrar, Librarian and Controller of Examinations. It is also competent to

admit colleges to the privileges of affiliated/constituent colleges.

Academic Council

The Academic Council is invested with the authority to prescribe syllabi and courses of study, and to regulate standards of teaching and examinations in the University.

The academic programmes of the University including research in various fields are carried out in the related faculties. Each Faculty is headed by a Dean nominated by the Vice-Chancellor from amongst the Professors of the Faculties in order of seniority for a period of 3 years.

Courses of Study

The following courses of study are offered in the University :

(a) Faculty of Arts

Ph.D., M.Phil and M.A. in Arabic, English, Hindi, Kashmiri, Persian, Sanskrit, Library & Information Science, and Urdu.

(b) Faculty of Social Sciences

Ph.D., M.Phil and M.A. in Economics, Geography & Regional Development, History, Political Science, Mass Communication and Journalism, Sociology and Islamic Studies.

(c) Faculty of Science

Ph.D., M.Phil and M.Sc. in Botany, Biochemistry, Electronics, Home Science, Mathematics, Chemistry, Statistics, Physics and Zoology.

(d) Faculty of Education

Ph.D., M.Phil and M.A. in Education and M.Ed.

(e) Faculty of Commerce & Management Studies

Ph.D., M.Phil and M.Com. and MBA.

(f) Faculty of Law

LL.M.

The aforementioned postgraduate programmes in all disciplines are each of two year duration comprising four semesters.

Besides, instruction is imparted in the following courses also : (1) LL.B.; (2) B.Lib & Information Science; and (3) B. Pharmacy Course.

Diploma Courses

Diploma Courses in Modern Spoken Arabic; Spoken & Literary Kashmiri; Dietetics; Business Administration; and Marketing Management.

Certificate Courses

Certificate Courses in Modern Spoken Arabic; Modern Spoken Persian; French; German; and Russian.

LL.B and B. Pharmacy courses are each of three year duration and all other courses are of one year duration.

Faculty of Non-Formal Education

The faculty of Non-formal Education has been instituted in the University with a view to extending benefits of education to people who are engaged in different occupations and are interested in their educational advancement or want to improve their professional skills in some specific areas. The faculty has three components : Department of Distance Education, Adult and Continuing and Extension Education Centre, and State Resource Centre.

Department of Distance Education

The Department of Distance Education was established in 1976 with the objective of imparting instruction through distance teaching and correspondence courses to in-service persons, persons belonging to remote areas and household women, that would enable them to improve their academic qualifications. The Department conducts the following courses (covering languages & Social Sciences and Commerce Courses) :

Undergraduate; B.Ed. Course; LL.B (Academic) Course; and Certificate courses in Library & Information Science, Urdu and Hindi.

Adult Continuing & Extension Education Centre

The Centre has been established with the objective of bringing about meaningful relationship between the University and the community at large, so as to promote social growth. Towards this end, the Centre undertakes suitable need-based education programmes to benefit people from all walks of life, especially the under-privileged class. The thrust of these programmes is on advancing professional/technical skills besides Adult Education.

State Resource Centre

The Centre was established in 1978 in pursuance of a scheme that the Ministry of Education, Government of India formulated in 1976. The main functions of the Centre are: organising training programmes for Adult Education Functionaries, designing need-based/skill-oriented courses, and producing materials for post-literary/continuing education.

Other Centres/Institutes

The University also runs the following Centres/Institutes etc :

Centre of Research for Development

The Centre of Research for Development was established in 1980 with the object of carrying out scientific research directed towards the economic development of Kashmir region. The Centre identifies the activities that are a major source of income to people in the Valley, and investigates the problems bearing on these activities, such as combating apple seat, promoting growth of mulberry trees, controlling insects, pests, etc.

Institute of Iqbaliat

The Institute of Iqbaliat was established in response to the wishes of the late Sher-e-Kashmir, Sheikh Mohammad Abdullah, who held the poet Iqbal in great esteem. The Institute is mainly devoted to research on the various aspects of Iqbal's poetry and thought.

Centre of Central Asian Studies

At this Centre, research on the multifarious aspects of life and civilisation of the people in the Central Asian region is carried out scientifically. Studies relating to the Soviet Central Asian Republics (Tajikistan, Uzbekistan, Turkmenia and Kirghizia), Iran, Afghanistan, Northern Pakistan, Tibet and Mongolia come within the scope of this Centre. These regions/countries have had close cultural links with this region since the medieval times. Accordingly, the UGC has recognised the Centre as an Area Study Centre.

University Service & Instrumentation Centre

The University Service & Instrumentation Centre renders useful services to the Postgraduate Science

Departments and the Science Departments in the constituent/affiliated colleges in the fabrication and maintenance of instruments, and is executing repairs to them when required.

Coaching Centre

The University has been running the Centre for several years now. It organises coaching classes for students belonging to the minority/underprivileged communities to enable them to perform well in various competitive examinations for recruitment to superior services under the Central and State Governments. Coaching is also provided by the Centre to those students who compete for UGC Research Fellowships.

Population Research Centre

The Centre has been established with the object of conducting demographic research and investigating the population problem in the State of Jammu & Kashmir in its varied dimensions with cent per cent financial support of the Ministry of Health & Family Welfare, Government of India.

Computer Centre

Established recently, the Centre is equipped with Vax 11/780 Computer System purchased by the University from the Digital Equipment Corporation, U.S.A.

Audio-Visual Research Centre

Here educational programme involving the participation of teachers from the affiliated colleges and the University departments will be produced for country-wide use through the medium of the TV.

The Centre was established in December, 1987. It has initiated steps to take in hand schemes and programmes aimed at promoting the use of English in this region for professional and communicational purposes. It will concentrate on ongoing training programmes for college teachers, curriculum development and production of innovative ELT materials relating to undergraduate courses.

Centre of Plant Taxonomy

The Centre started working in 1981 as a part of the Department of Botany. However, realising the importance of the Centre, the University Council gave it a separate entity, with its own budget head, etc.

The aim of the Centre is to provide research and other facilities in plant systematics to plant researchers within and outside the country. The Centre intends to start short term courses in plant collection and plant systematics.

Faculty of Engineering

Faculty of Engineering is comprised of the following departments :

(1) Department of Physics, (2) Department of Chemistry, (3) Department of Electronic Engineering, (4) Department of Chemical Engineering, (5) Department of Metallurgical Engineering, (6) Department of Mathematics, (7) Department of Humanities, (8) Department of Mechanical Engineering, (9) Department of Electronics, and (10) Department of Civil Engineering.

Bachelor of Engineering courses are taught in all the above mentioned Departments.

Faculty of Medicine

The faculty comprises the following Departments:

(1) Department of Gyn ecology & Obstetrics, (2) Department of Medicine, (3) Department of Blood Bank, (4) Department of Dermatology (5) Department of Paediatrics, (6) Department of Surgery, (7) Department of Orthopaedics, (8) Department of ENT, (9) Department of Radiology, (10) Department of Anaesthesiology, (11) Department of Ophthalmology, and (12) Department of Physiology.

MBBS Course is taught in all the above mentioned Departments. MD and MS Degrees are also awarded by them.

Students' Welfare

The Dean of Students' Welfare looks after the Student's activities. The office of the Dean involves the students in diverse academic and cultural programmes : Promoting such activities as Inter-University debates, quiz competitions, educational tours including visits of our students to various centres of learning/culture in the country, social service camps, hiking-cum-trekking expeditions, etc. It also provides useful information to the students concerning their employment.

Scholarships

The University offers Postgraduate Merit Scholarships to the meritorious students. Research

scholarships are also granted to the scholars engaged in research in all the disciplines. Besides, various scholarships are offered by the State/Central Govt.

Hostel Accommodation

The University has two Boys' Hostels—Ghani Kashmiri and Sheikhul Alam, and one Women's Hostel, with accommodation for 150 men and 80 women students. New Hostel is under construction for 200 students.

University Guest House & Faculty Complex

The University Guest House is located at a beautiful spot on the main Campus, offering a vantage-point for a full view of the charming Dal Lake and the surrounding landscape. It acquired more accommodation with the recent addition of another wing and lies close to the faculty complex located on the Nasim Bagh Campus.

Staff Quarters

Residential quarters for the staff are available on the main as well as the Nasim Bagh Campus. The University is building 150 additional houses for the teachers and employees of the University on a piece of land measuring 103 Kanals, at a place known as Mirza Bagh, which lies on the bank of the Nagin Lake

Iqbal Library

The University has a Central Library, called the 'Iqbal Library' which is housed in a big building located on the main Campus. Presently it has about 4 lakh books; it also subscribes to about 700 Foreign and 200 Indian Journals, and has a stock of several thousand manuscripts concerning different fields of research. In addition, all the Departments/Centres/Institutes are equipped with seminar libraries relating to their respective disciplines.

Seminars/Conferences

During the past few years the University has deputed several faculty members to various prestigious international seminars/conferences held abroad in various developed countries.

Similarly conferences, seminars, workshops, extension lectures and summer institutes are regularly organised in the University.

Equipment Grants

Special equipment grants are also provided to the departments/research centres for modernizing the laboratory facilities available in the University. A portion of these grants is provided by the UGC. □

The Core of Indian Civilization

"A hierarchical system of castes with priests dominating it and a world-negating mystical philosophy emanating from forest abodes are sought to be established by some as the core of Indian civilization. That was never the case. The Buddhist, Jaina and Lokayata philosophies are as much Indian and valuable as the Vedic. The Sangam literature and the hymns of Alvars and Nayanars constitute an equally important and valuable component of our intellectual and spiritual tradition. The Artha-and Kama-shastras are also Shastras not inferior to Dharma-shastras. Dharma, artha and Kama (morality, prosperity and pleasure) have to be equally cultivated," said Prof. K. Satchidananda Murty, former Vice-Chairman of the University Grants Commission, while delivering the Convocation Address at the fourteenth annual convocation of the University of Kashmir. Excerpts

Over the years I have been, whenever possible, drawing attention to what some anthropologists and sociologists have shown : Indian civilization was formed by a number of processes which related diverse elements, and was consolidated through an interaction of popular lore and reflective thought.¹ India could be considered as a separate and definable culture area, with a distinct and definable civilization with local and regional manifestations.² The people of India may be classified as Indo-Dravidian and not as members of any European or Asiatic race.³ Alternatively Indian population may be considered as constituting essentially a basic type (Palaeo-Mediterranean or Mediterranean), with regional variations.⁴ The Indian languages, though belonging to the families of Indo-Aryan, Dravidian, Austro-Asiatic and Sino-Tibetan speech families, influenced each other, fused and developed common traits, giving rise to a pan-Indian type in language.⁵ So, India is a linguistic area.⁶ It has been also pointed out that there is a common Indian religious approach and philosophy of life.

When this is recognised, one

would not wholly identify Indian culture with what is found in the Veda-Dharma Shastra-Itihasa-Purana tradition, and Indian philosophy with the Brahmanical Shad-darsanas and, much less, with Vedanta alone. A hierarchical system of castes with priests dominating it and a world-negating mystical philosophy emanating from forest abodes are sought to be established by some as the core of Indian civilization. That was never the case. The Buddhist, Jaina and Lokayata philosophies are as much Indian and valuable as the Vedic. The Sangam literature and the hymns of Alvars and Nayanars constitute an equally important and valuable component of our intellectual and spiritual tradition. The Artha-and Kama-shastras are also Shastras not inferior to Dharma-shastras. Dharma, artha and Kama (morality, prosperity and pleasure) have to be equally cultivated. "Dharmarthakamah samameva sevyah". (*Mahabharata*, the fifth Veda.) This is the classical Indian view.

Divine revelation is contained not only in Sanskrit scriptures, but in Hebrew and Arabic sacred books also, and saving wisdom is not to be found only in the Sanskrit

sources but also in the Pali, Prakrit and Aramaic ones. No race, country, nation or language had ever the monopoly of revelation or saving knowledge. Moreover, revelation has been continuous and progressive. The Upanishads disclosed truths not found in the Samhitas, and the Bhagavadgita proclaims truths not contained in the earlier two, while the Bhagavata unveils aspects of Divine Reality and Action about which the former holy books did not speak of.

This position has not been expounded with greater force anywhere else than in Kashmir. Utpala enunciated the theoretical basis for it : "Tatrantaram tattvamekam"⁷. The inner reality in all is One. From this Kshemaraja deduced : "Tadbhumikah sarvadarsanasthitayah." All philosophical positions are the roles of that one reality, the one independent principle, Consciousness⁸. Kshemaraja had the vision and courage to explain that materialism, Buddhism, Vedanta, etc., including his own doctrine, are only different displays, free self-expressions, of the one principle, Consciousness. This means there is only one all-inclusive *Idea* which manifests itself in the several ideas and combination of ideas or theoretical formulations.

While in the far north of India, in the Himalayan regions, this truth was being proclaimed thus in the 9th and 10th centuries A.D., at approximately the same time it was also being asserted in the far south of our country, in the Dravida plains irrigated by the Kaveri and Payoshni rivers. The *Bhagavata* teaches : Just as one and the same thing having a plurality of qualities is apprehended by the senses in multiple ways, the one and the same God is presented by the shastras in different ways⁹. "Ekonancyate tadvat Bhagavan

sastravartmabhish". Elsewhere, the same text has these beautiful words : The Supreme Person is of the nature of Pure Awareness hidden within us; His nature is such that it is in accord with all doctrines¹⁰. "Sarvavadavishay-apratirupasilaṁ"—mahapurushamatmanigudhabodham."

In the 14th century Kashmir flourished that great spiritual personality, Lalla Yogisvari, popularly known as Lal Ded or Lal Didi, whose sayings, considered to be "pearls and diamonds" of Kashmiri literature, "moulded the national mind and set up a national ideal". "She was, in fact, a predecessor of the Mediaeval Reformers of India—Ramananda, Kabir and the others of the 15th and later centuries".¹¹ She is, thus, very important in the history of Hinduism. Lalla found after much searching the Self, the Lord, in her own soul. Consequently, knowledge and light suffused her whole being. Seeing the Self is near and He is all, one may engage oneself in one's own profession or work whatever it is and yet find Freedom in Inaction. Spiritual progress is possible for anyone who works without thinking of self and lays all that he does before the self, "setting faith and duty before self". She taught : Shiva shines everywhere; do not discriminate between a Hindu and a Muslim : If you are wise recognize yourself and know the Lord."

The fact that there is only One True Light was not recognized only by the Indians. One of the greatest mystics and sages of the world, Jalalul-din Rumi (13th century) wrote : "The lamps are different, but the Light is the same : it comes from Beyond. If thou keep looking at the lamp, thou art lost: for thence arises the appearance of number and plurality. Fix thy gaze upon the Light."¹² Earlier than Rumi, another great mystic and sage, Ibn

Arabi (late 12th century) taught that in every form of belief about God He manifests himself. Everyone conceives God according to his own idea, not out of his knowledge. A believer praises the God who is in the form of his belief, with whom he has entered into relation. So, according to Ibn Arabi, a believer who criticizes others beliefs shows his ignorance.¹³

It is fortunate that our sub-continent produced two such great men as Abul Kalam Azad and Muhammad Iqbal. "Their thinking is the culmination of all that the Muslim community of the sub-continent has contributed to reflection on Islam and the modern world over almost two centuries."¹⁴

Analysing the philosophies of Tagore and Iqbal, S. Abid Husain concluded that "in the depths of Indian mind, two streams of religious consciousness spring from the same source and flow in the same channel, so that no real differentiation is possible between them. It is only on coming to the surface——they divide into two distinct streams taking different courses, known under the name of the Hindu and Muslim religions."¹⁵ Husain adds that they meet again in social, moral and aesthetic life.

In Azad is found, wrote Rahab Nabi Khan, the beginning of a true synthesis of modernity, secularism, democracy, universalism and Islam. Islam's message is the same as that of other prophets to all nations and races. In Azad's view the essence of all religions is Islam. He formulated "on the basis that is orthodox and Islamic", continues Khan, "the most tolerant and essentially modern view of religious tolerance and the autonomy of the individual conscience in the matters of religion."¹⁶

Our nation has just concluded the celebration of S. Radhakrishnan's birth centenary, and is going to start that of Jawaharlal

Nehru. To narrate the following episode now is relevant. In a meeting held in Rashtrapati Bhavan for the presentation of Sri Aurobindo's portrait, Radhakrishnan referred to the following Upanishadic passage "Human beings of great intellectual power have doubts, divisions and discords. The rational man has to grow into the spiritual man. That is the task set to each individual if he is to fulfil his destiny as a human being." Nehru who was present and sat silent with closed eyes is reported to have said : This is the essence of philosophy and science; what else is there?¹⁷

The Upanishad might have asked us to become spiritual. Many of us have not yet become even rational. Let us first become that; later we can think of growing into the spiritual. "The most vigorous and liberal thinker in Islam"¹⁸. Al-Razi (865-925) exhorted that everyone ought "to search and consider religious law to the limit of his strength and power", for whoever does so in a sustained way will arrive at the right goal". Even if someone fails, "God is more likely to forgive and pardon him as He does not require of anyone what is beyond his capacity."¹⁹

REFERENCES

1. Robert Redfield
2. Bernard S. Cohn, Elizabeth Bacon and A.L. Kroeber
3. W.C. Boyd
4. B.S. Guha
5. S.K. Chatterjee
6. M.B. Emeneau
7. *Isvara Pratyabhijna*, II. 2.
8. *Pratyabhijnahridayam*, 8.
9. *Bhagavata*, III. 32. 33.
10. *Op cit.*, XII. 8 49.
11. Sir R.C. Temple
12. R.A. Nicholson's trans
13. See S.A.Q. Husaini. *Ibn Al-'Arabi Lahore*, 1963.
14. Rahab Nabi Khan in : *Islam, Philosophy and Science*, Four Public Lectures, Unesco Press, 1981, p. 94
15. S. Abid Husain, *The National Culture of India*, New Delhi, 1982, p. 155
16. Khan, *op cit.*, pp. 119, 127.
17. Radhakrishnan, *Speeches & Writings*, Second Series, p. 341
18. M.M. Sharif (ed.), *A History of Muslim Philosophy*, Vol. I, Karachi, 1981, p. 448.
19. A.J. Arberry, *The Spiritual Physick of Rhazes*, pp. 106-7.

Nehru Centenary Celebrations at JNTU

Jawaharlal Nehru Technological University (JNTU) has drawn up ambitious plans to commemorate the birth centenary of Pt. Jawahar Lal Nehru. A number of national Seminars / Workshops have been planned: notable among the subjects to be discussed are: University - Industry Interaction, Low Cost Building Materials, Modern Trends in Communications technology, etc.

An inaugural function was got up by the University recently at which Sri A. Madhava Reddy, the Andhra Pradesh Minister for Home Affairs, was the chief guest. Speaking on the occasion Sri Reddy described Nehru as an Apostle of peace, who stroves relentlessly for the independence of India and later for all round national development. He expressed his deep appreciation of the various measures initiated by the University to give a new dimension to the quality of technological education in the State. He said that there were a total 23 Colleges of Engineering in the Government/University sector and private sector and 53 Polytechnics in both the sectors. He said that the Government was spending 41 crores of rupees annually on Technical Education. In view of the crucial role technical education was playing in the country, allocation for Technical education would have to be even higher, Mr. Reddy added. Dr. D. Swaminadhan, Vice-Chancellor, JNTU, who presided, said that the University was striving to meet the high criteria for the Universities in discharging their academic duties adequately and for forging ahead to the desired goal of excellence in Higher Technological Education. To achieve this laudable objective, the Vice-Chancellor announced, the

University has taken up many new programmes during the Nehru Centenary Year. A perspective plan for development activities during the next decade has been drawn up. Ten schools of Excellence in Emerging and Traditional Areas of Technological learning, like Bio-Technology, Environment Engineering and Water Resources, Energy Studies, Transportation Engineering, Management Studies, have been set up. A School of Excellence for Postgraduate Studies and Research has also been set up to organise the postgraduate and Research Programmes effectively in conventional areas. The University has established a School of Excellence for Continuing and Distance Education and has been offering B.Tech., (Correspondence-cum-Contact) programmes. The University has now launched M.Tech. (Correspondence-cum-Contact) programme in five areas: Environmental Engineering, Advanced Electronics, Electrical Power Systems, Production Engineering, and Industrial Engineering and Management. Apart from growing vertically, proposals are under active consideration to expand the facility of Distance Education to aspirants all over the country, so that Engineering Education will truly be taken to the doorstep of the learners. The University hopes that the School will eventually grow into a National Open Technological University and thus become a pace-setter for innovative education programmes in the country. The University has also established a School of Computer Science, in view of the increasing and pivotal role computers are playing in post-industrial society on the threshold of the twenty-first century. A School of Plan-

ning and Architecture and a School of Fine Arts have also been established. A Career Advancement and Resource Development Centre (CARD), which offers counselling, guidance and coaching for Engineering students belonging to SC/ST, to take competitive entrance and recruitment test in Engineering and Technology has also been set-up.

Anna Varsity's Instt. of Remote Sensing

The Institute of Remote Sensing (IRS) of the Anna University is emerging as the country's top Institution for research and manpower training in this high-tech area. According to Dr. V.C. Kulandaiswamy, Vice-Chancellor, a Rs. 4.4 crore technical assistance from West Germany has facilitated IRS acquisition of the most sophisticated remote sensing photo and data interpretation equipment. Training of the IRS teaching staff in German Institutions was also part of the ongoing West German Government aid.

He said remote sensing, though a high-tech area, could become an important tool in eradicating poverty and raising the economic levels of the people. It would be of tremendous help in the village and district level planning the Government intended to introduce, the Vice-Chancellor added.

Remote sensing through satellite imagery or aerial photogrammetry help acquisition of real time data and accurate mapping of natural resources on the ground level and underwater interpretation of such imagery facilitates, for instance, land use mapping, evaluation of ground water resources, determination of forest cover and assessment of the cropped area.

IRS Director Prof. R. Palani-velu pointed out that the resources maps the Institute prepared from satellite data, being of small scale, were best suited for regional planning or for obtaining information over a large extent of land cover.

The maps produced from aerial photographs taken from aircraft, being of medium and large scale, were very useful for micro-level planning. Such maps would be an integral part of the new process of planning being introduced in India, he added.

M.Tech in Atmospheric Sciences

The University Grants Commission (UGC) is reported to have decided to introduce a two-year master of technology (M. Tech) course in atmospheric sciences in five universities of the country and at the Indian Institute of Science at Bangalore. The five universities are those of Calcutta, Pune, Cochin, Andhra and Gujarat.

Earlier, the atmospheric sciences were only dealt with by the meteorological departments and studies on the climatic changes and weather predictions were undertaken only by them. The decision to introduce the master's course has been taken as the government-run meteorological departments were only dealing with the operational side of atmospheric sciences.

According to Dr. Dilip Sinha, Pro-Vice-Chancellor of Calcutta University, the course had already been started in May this year. He said that students holding a master of science degree in subjects like Computer Science, Applied Mathematics, Physics, Electronics, Radio Physics are eligible for the course.

Students from the River Research Institute and similar institutions will also be eligible. The course will be divided into three semesters. An important feature of the third semester is that students will be sent for internship to various institutions like the Space Application Centre at Ahmedabad.

Harbour Research Institute

The Union Ministry of Surface Transport proposes to set up a Harbour Research Institute to coordinate and disseminate information in the fields of port and navigation. The major areas of activity contemplated for the proposed research include simulation of port operations, optimisation of cargo-handling, navigation simulation, shipping economics, materials management, transport logistics mathematical model studies and documentation and statistical services.

A three-member Dutch team has been retained by the Ministry as Identification Mission. The team which is being led by Prof. L.J. Mostertman, honorary fellow in the International Institute for Hydraulics and Environmental Engineering, will visit other major ports, the Indian Institute of Port Management, Calcutta and the National Institute of Port Management, Madras.

Microbes and the Human Society

The Society of Microbiologists of Delhi, in collaboration with the Department of Microbiology, University of Delhi South Campus, proposes to organize a three-day seminar on 'Microbes in the Service of Human Society' on October 3-5, 1989. The objective of the seminar is to create a general awareness about the diverse activities of micro-

bes in relation to human welfare. Eminent Microbiologists from various fields of the discipline, namely, industrial, agricultural and medical, are expected to deliver talks in their respective specialities. These include Prof. T.K. Ghosh (I.I.T., Delhi), Prof. G.S. Venkataraman (I.A.R.I., Delhi), Prof. Srinivas (A.I.I.M.S., Delhi), Prof. K.G. Mukherjee (Delhi University, Delhi), Prof. P. Tauro (H.A.U., Hisar), Prof. H.K. Das (J.N.U., Delhi); Prof. P. Seth (A.I.I.M.S., Delhi) and Prof. K.V.B.R. Tilak (I.A.R.I., Delhi).

The topics proposed to be discussed at the Seminar include (i) Microbes as source for feed and food; (ii) Biology of Cyanobacteria—A rich source of single cell protein; (iii) Recent developments in biological nitrogen fixation; (iv) Microbes and you; (v) Bio-fertilizers in the service of human society; (vi) Role of vesicular arbuscular mycorrhiza in agriculture and forestry; (vii) Multiple copies of chromosome in *Azotobacter Vinelandii*; (viii) Are we learning science; (ix) Viruses and Cancer; and (x) Teaching of Microbiology in Indian Universities.

At the valedictory session discussion will be held on 'The teaching of Microbiology in Indian Universities' to help update the standard of microbiology in order to meet the needs of this rapidly growing subject in the future.

The Society of Microbiologists of Delhi was established in December 1988 at the University of Delhi, South Campus. The aims of the society are (a) to supplement the efforts of AMI, (b) organisation of national, international workshops and symposia, (c) popularisation of science through lectures, seminars and poster exhibitions in public, and lastly to act as liaison-

ing platform between academic microbiologists and the industries for technology transfer.

Prof. G.S. Venkataraman (IARI, New Delhi) is the President of the Society while Dr. R.K. Saxena (University of Delhi, South Campus) is its Secretary.

Special Assistance for JNU Centre

The Centre for Economic Studies and Planning in the School of Social Sciences at the Jawaharlal Nehru University has been selected under the UGC's Programme of Special Assistance. Under this scheme, the Centre will receive for five years special assistance for creating necessary infrastructure including faculty positions.

The programme is intended to raise the quality of teaching/research in departments selected on the basis of their work, standing and potential for further development. It aims at promoting teaching and research in special areas of studies and multidisciplinary courses.

Nehru as a Writer

The Indira Gandhi National Open University (IGNOU) organised recently a one-day symposium on 'Nehru as a Writer'. Professor G. Ram Reddy, Vice-Chancellor, who presided, observed that while Nehru was universally recognised as the architect of modern India, not enough critical attention had been paid to him as a man of letters who deserved a prominent place in the history of contemporary Indian writing in English—as an imaginative writer with a poetic vision, a literary biographer, letter writer, historian and patron of arts.

Prominent novelists, poets and litterateurs including Dr. Mulk Raj Anand, Prof. Indra Nath Choudhuri, Prof. Shiv K. Kumar and Prof. Ramesh Mohan participated in the discussion and presented their papers. Speaking on the occasion Dr. Mulk Raj Anand highlighted the role of Nehru as a Writer while Prof. Choudhuri in his paper, dealt at length with the role of Nehru in the development of Indian languages. Prof. Ramesh Mohan discussed Nehru's personality as a 'Man of Letters'.

Focus on Research

Prof. Ashoka Chandra, Educational Adviser (Technology), Ministry of Human Resource Development, called upon University scholars to concentrate on research and development. Prof. Chandra was delivering the fifth Tamaki endowment lecture on "Technical education — some issues" at Jawaharlal Nehru Technological University recently. He said that research should become an integral part of the institutions since it was a problem solving strategy.

Stressing the need for technology forecast, Prof. Chandra said that manpower and technological plans should be drawn up in accordance with the needs of change. Technology forecast should be a continuous process, he said.

Dr. D. Swaminadhan, Vice-Chancellor, who presided, said that late Dr. A. Tamaki was a noted chemical engineer of Japan who had worked for the university for instituting endowment lectures in technology and science.

Admission to ISI Courses

Indian Statistical Institute, Calcutta will conduct all-India

selection tests for admission to the undergraduate and postgraduate courses for the session 1990-91. The courses are Bachelor of Statistics (Honours); Master of Statistics; Master of Technology in Computer Science; Master of Technology in Quality, Reliability and Operations Research; Research courses in Mathematics, Statistics and Economics leading to registration for the Ph. D. degree of the Institute; Junior Research Fellowships in various fields in which the Institute has research interests; One Year Evening Course in Statistical Methods and Applications; Certificate/Diploma Course on Operation and Programming of Automatic Data Processing Equipment; and Evening Course for Certificate / Diploma in Statistical Quality Control/Operations Research.

The tests will be held on May 13, 1989 at the Centres proposed to be located at Bangalore, Baroda, Bhubaneswar, Bombay, Calcutta, Delhi, Guwahati, Hyderabad, Madras, Nagpur, Patna, Sambalpur, Trivandrum, Varanasi, Waltair.

Prospectus and application forms may be had from the Dean of Studies, Indian Statistical Institute, 203, B.T. Road, Calcutta-35.

Bhide Appointed IUC Director

Prof. V.G. Bhide; former Vice-Chancellor of the University of Poona, has been appointed the first Director of the Inter-University Consortium (IUC) for Department of Atomic Energy (DAE)—University Grants Commission (UGC) Project at the Devi Ahilya Vishwavidyalaya, Indore (Madhya Pradesh). The Inter-

University Consortium is being set-up jointly by the UGC and DAE, Govt. of India, to provide a new networking framework to enable the teachers and research scholars of the University system to participate in design, fabrication, opera-

tion, management, and utilisation of DAE's frontline research facilities such as the Dhruva Reactor (Bombay), the Variable Energy Cyclotron Centre (Calcutta), and the Synchrotron Radiation Source Centre (Indore).

between voluntary agencies associated with CAPART and agricultural research institutes.

The specialists, who are involved in transfer of technology in their respective States, are attending the programme, which will cover operation, maintenance and repairs of the latest agricultural equipment.

Rs. 55 Lakh Project Grant for PAU

The United States of America, Department of Agriculture, (International Co-operation and Development) has sanctioned three projects for Punjab Agricultural University (PAU) under its United States India Fund Research Grant Programme. Under these projects, estimated to cost-over Rs.55 lakhs, research will be conducted to enhance the fertilizer and water use efficiency in dryland crops and cropping systems. Various models will be developed to optimise production in arid and semi-arid regions. The results of these projects will help in increasing productivity in arid and semi-arid regions by improving the efficiency of water and fertilizers. Results will not only be useful to this State but will also enhance the agricultural production of other rainfed areas of the country.

AFST Founder's Day

The Department of Food and Nutrition of Haryana Agricultural University (HAU), in collaboration with Hisar chapter of Association of Food Scientists and Technologists (AFST) celebrated its Founder's Day at the university. Presiding over the inaugural session Dr. Har Swarup Singh, Vice-Chancellor, HAU said that there was need to deploy more extensively the food science technology so that fuller benefit of the agricultural resources were derived. This technology, he said, helped the conservation of food through prevention of food losses both in the field and during storage; in the improved processing of food-grains which constitute 80% of the staple diet of the masses; in the development of nutritious foods and proper utilization of available protective foods such as fruits and vegetables, meat and fish; and in converting the economy from being predominantly export of raw materials to processing and export of value-added finished products.

In view of the importance of food science and technology in the present day context of servicing mankind through better food, the Government of India, had set up a separate Ministry of Food Processing. Dr. Singh asked the food scientists to evolve a technology which would be simple, less

expensive and easily adaptable for improving the food availability, food quality and consequently the nutritional status of the masses in rural India.

Programme on Improved Agri. Machinery

A two week training programme for subject matter specialists on improved agricultural machinery and equipment for crop production and processing was recently organised by the Indian Agricultural Research Institute. It was opened by Mr. S.M. Patankar, Director-General, Council for Advancement of Peoples Action and Rural Technology (CAPART). Speaking on the occasion he stressed the need to establish link

News from UGC

INSAT 1-B Programme of UGC

Between 11th October to 19th October, 1989 the following schedule of telecast on higher education through INSAT 1-B under the auspices of the University Grants Commission will be observed. The programme is presented in two sets of one hour duration each every day from 12.45 p.m. to 1.45 p.m. and 4.00 p.m. to 5.00 p.m. The programme is available on the

TV Network throughout the country.

1st Transmission

12.45 p.m. to 1.45 p.m.

11.10 89

"Eyes in the Sky—Remote Sensing—II"

"Dreams Which Came True"

12.10.89

- "Pulse Circuits—I"
- "Earthquake Effects on Civil Structures"
- "Learning a Foreign Language-III"

13.10.89

- "Vedic Mathematics—IV"
- "Comparative Politics"
- "Arid Zone Ecology Phase—I"

14.10.89

- "Glove Puppet Making"
- "The Art of Cartooning—II"
- "Hesse's Life Work"

15.10.89

No Telecast

16.10.89

- "Lesers—III"
- "Consequences of Inflation and its Control"
- "Cocoa Cultivation"

17.10.89

- "The Basics : Focus on Mathematics"
- "Panchakarma—I: Purvakarma"

18.10.89

- "Eyes in the Sky—Remote Sensing—III"
- "The American Vision"

19.10.89

- "Pulse Circuits—II"
- "Secrets of Greenland Ice"
- "The Human Seasons—John Keats"

2nd Transmission

4.00 p.m. to 5.00 p.m.

11.10.89

- "Remote Sensing—Application and Technology"
- "Uninscribed Coins of Andhra"
- "Activity Rhythms of Mosquito"

12.10.89

- "Diode—Basic Electronic Component"
- "Preparing Life Skills"

13.10.89

- "Story of Our Universe—VI"
- "Role of Politics in Society"
- "A Delicate Balance"

14.10.89

- "Pearl of Ceramics"
- "Formation of Contract"
- "Mail—2"

15.10.89

Telecast

16.10.89

- "The Beauty, The Beast and the Sir—I"
- "Understanding Money : Doing Without Money—Barter System"
- "Raw Materials : Natural Rubber"

17.10.89

- "The Basics : Oral Language Skills"
- "Ayurveda Series—I : Silent Sentinels"
- "Macro the Magician"

18.10.89

- "Energy and Architecture"
- "Microbiology of Milk—I"

19.10.89

- "Rectifiers"
- "Voyage En Gaule"
- "Present Continuous Tense"

Ph.Ds, M.Phils Exempted from Teachers Tests

The University Grants Commission (UGC) has decided to exempt the holders of Ph. D. and M. Phil degrees from appearing in the eligibility tests to be conducted twice a year in June and December by the UGC/CSIR (Council for

Scientific and Industrial Research) for recruitment of lecturers in universities and colleges upto December, 1992 and December, 1990 respectively. Thereafter, such candidates will also have to appear in the qualifying tests along-with other candidates for first appointment as lecturers.

In future the minimum eligibility condition for appearing in the common Junior Research Fellowships (JRFs)/Lecturers tests to be conducted by the UGC and CSIR will be 55 per cent marks at the postgraduate degree level, instead of second class Master's degree for JRF examination as at present.

Nominations for Commonwealth Awards

The University Grants Commission (UGC) has asked the Universities to nominate suitable teachers for the awards of Commonwealth Academic Staff Fellowships and Scholarships for the year 1990-91.

The Commonwealth Academic Staff Fellowships tenable for one academic year are intended to help the teachers working in the universities and affiliated colleges to enhance their qualifications and experience in the Universities or similar institutions in the United Kingdom. The Scholarships are, however, normally for 2 academic years to enable the awardee teachers to complete their Ph. Ds. Though no special areas of study have been earmarked for this purpose, medicine and surgery have been excluded as these have been separately covered under Commonwealth Medical Awards.

As the number of fellowships and scholarships is limited, the Universities have been asked to nominate not more than two

teachers from each University and its affiliated Colleges. The last date for the receipt of nominations in the prescribed proforma by the

University Grants Commission is 31st October, 1989. Interested teachers should approach their University for further details.

AIU News

64th Annual Meeting

The sixty fourth annual meeting of the Association of Indian Universities is being held at the University of Kashmir, Srinagar from October 4 to October 8, 1989. Dr. Sukhdev Singh, President of the Association and Vice-Chancellor of the Punjab Agricultural University will preside. A major attraction at the meeting will be the Group Discussion on University Finances. Keynote papers are being contributed by Dr. D.M. Nanjundappa, Vice-Chancellor,

University of Bangalore, Shri Anand Sarup, Chairman, National Book Trust and former Education Secretary, Govt. of India, and Dr. Har Swarup Singh, Vice-Chancellor, Haryana Agricultural University.

Another highlight on the occasion would be the meeting of the member vice-chancellors with the University Grants Commission. 6th October, 1989 has been set apart for interaction between the

Vice-Chancellors and the members of the UGC. After the plenary session the members are likely to meet in group to discuss certain important issues and perspectives regarding higher education. Besides Prof. Yesh Pal, Chairman UGC, all other members of the Commission and about 100 Vice-Chancellors are expected to participate.

A Book Exhibition is also being organised on the occasion.

We Congratulate ..

(i) Dr. R.V.R. Chandrasekhara Rao who has been appointed Vice-Chancellor of the Andhra Pradesh Open University, Hyderabad.

Communication

NEW HOCKEY

Sir,

Unlike Football, Hockey is being played on poly-grass and astro-turf fields, so this game is played faster and requires quicker adjustments. As such the skill of the game has been curbed by its speed. Accordingly, the game needs modifications as outlined below :

1. The size of the Hockey Field be reduced to 90×60 yards = 5,400 square yards.
2. Only three latitudinal lines are to be drawn in the field of the play. Central line being 45 yards from the two goal lines and the two other lines 30 yards away from the central line, in the two
3. The number of the players be reduced to nine; distributed as three forwards, three half backs, two full backs & one goal keeper.
4. Only three forwards are to play against two fullbacks and a goal keeper, while the Hockey ball is being played in the striking Semi-circles. The same strength is to be authorised both during the normal play and at the time of short and long corners. Penalty stroke

halves respectively. The striking semi circles are to be marked from the goal line at a distance of 14.5 yards

is to be played exclusively, at the time of Tie-breaker.

5. Goal mouth is to be designed as nine feet wide and seven feet high, covering an area of 9×7 feet = 63 feet.
6. Duration of the game having each half of 27 mts. with an interval of six mts. $27+6+27=60$ mts.

The game is to be played in a balanced/style, to avoid overcrowding, maled and foul play. The goal mouth is to be reduced, to be fairer to the goal keeper.

B. S. Grewal
Coordinator, National Service-cum-
Chief Sports Organiser,
Punjabi University,
Patiala-147002.

CALENDAR OF EVENTS

Proposed Dates of the Event	Title	Objective	Name of the Organising Department	Name of the Organising Secretary/Officer to be Contacted
Oct. 3-5, 1989	3-day Seminar on Microbes in the Service of Human Society	Topics for discussion include Microbes as source for feed & food, Biofertilizers in the service of human society. Viruses and cancer, Teaching of Microbiology in Indian Universities, etc.	Society of Microbiologists of Delhi	Dr. R.K. Saxena Dept. of Microbiology, Univ. of Delhi South Campus, Benito Juarez Road, New Delhi-110021
Oct. 13-15, 1989	National Symposium on Environmental Management Strategies for Pathogenesis in Parasitic Diseases	To discuss economic significance of parasitic diseases in fish, biological control of pathogens and environmental interactions, disease prediction hypothesis & management of transmission dynamics	Department of Zoology, University of Allahabad, Allahabad	Dr. Sandeep K. Malhotra Convenor, Post-Box No. 2010, Parasitology Laboratory Department of Zoology University of Allahabad Allahabad
Oct. 16-18, 1989	Fourth Annual National Convention of Indian Association of Physics Teachers (IAPT)	To discuss Physics Teaching at the Undergraduate level	Govt. Science College, Raipur (M.P.)	Shri M.G. Tarnekar, Convenor C/o Department of Physics, Govt. Science College, Raipur-492010.
Oct. 20-22, 1989	National Symposium on Dynamism in Chemical Reaction	Proposed topics include Energetics, Dynamics and Reaction Kinetics; Catalysis; and Chemical Monitoring of Environment Pollutants	Atarra Postgraduate College, Atarra, Banda (U.P.)	Dr. R.K. Shukla Head, Department of Chemistry. Atarra P.G. College Atarra, Banda (U.P.) 210201
Oct. 27-28, 1989	All India Seminar on Construction Management	Proposed topics include construction materials, construction techniques, Work site organisation, Safety Engg. and Role of Computer in Construction Management	Civil Engineering Department, Thapar Institute of Engineering & Technology, Patiala	Dr. C.B. Kukreja, Prof. & Coordinator, All India Seminar on Construction Management, Deptt. of Civil Engineering, Thapar Instt. of Engg. & Tech., Patiala-147001 (Punjab)
Dec. 4-7, 1989	International Conference of Engineering Software	To deliberate on the recent advances in the software development and associated computational methods for specific engineering applications	Indian Institute of Technology, Delhi	Prof. C.V. Rama-krishnan, Head, Dept. of App. Mech. IIT, Delhi, Hauz Khas, New Delhi-110016
Dec. 13-15, 1989	13th National Systems Conference—1989	To bring out the various systems methodologies as applied to Engineering, Industrial Economics, and social problems.	Department of Electrical Engineering, IIT, Kharagpur	Prof. M.K. Ghosh, Department of Electrical Engineering, Indian Institute of Technology, Kharagpur-721302

UNIVERSITY OF CALICUT

(Institute of Correspondence Courses & Continuing Education)
Calicut University P.O., Kerala, PIN : 673 635

COURSES OFFERED

Course	Duration	Optionals	Eligibility for Admission	Last Date for the receipt of the filled up applications in this Institute
			(4)	(5)
REGULAR STREAM				
(a) Pre-Degree	2 years	Four combinations in Arts and Commerce	A Pass in SSC/SSLC Exam. of Kerala State with eligibility for College admission as recorded in the certificate or any other qualifications recognised as equivalent thereto.	31st August of every year.
(b) B.A. Degree	3 years	1. History Main with General Economics and Political Science as Subsidiaries. 2. Economics Main with Indian History and Political Science as Subsidiaries. 3. Politics Main with General Economics and World History as Subsidiaries. 4. Malayalam Main with Sanskrit as Subsidiary subject.	A Pass in the Pre-degree Examination of Calicut University or an examination recognised as equivalent thereto.	31st August of every year.
(c) B.Com. Degree	3 years	Elective Subjects offered. (i) Co-operation or Cost Accounting.	A Pass in the Pre-degree Examination of University of Calicut or an examination recognised as equivalent thereto with atleast one Commerce subject. Candidates who have not taken atleast one Commerce Subject for P.D.C. should get atleast 45% of the aggregate Marks in the PDC Exam. A concession of 5% Marks will be given to those who belong to SC/ST and other Backward communities.	31st August of every year
(d) M.A. Degree	2 years	1. Politics 2. Sociology	A Pass in the B.A. degree course of this University or an Examination recognised as equivalent thereto with a minimum of 45% in Part III Optional Main Subjects (Excluding Subsidiaries). A concession of 5% marks will be given to those who belong to SC/ST/OBC.	Thirtieth September of every year.
LIBERALISED STREAM				
(a) B.A. Degree	3 years	1. History Main with General Economics and Political Science as Subs. 2. Economics Main with Indian History and Political Science as Subsidiaries. 3. Politics Main with General Economics and World History as Subsidiaries. 4. Malayalam Main with Sanskrit as Subsidiary subject.	All those who have attained the age of 20 years as on first of June of the admission year. No Basic Qualification is required for granting admission through the Liberalised Stream.	30th June of every year.
(b) B.Com. Degree	3 years	Elective Subjects offered Cost Accounting or Co-operation.	All those who have attained the age of 20 years as on first of June of the admission year. No Basic Qualification is required for granting admission through the Liberalised Stream.	30th June of every year.

PROCEDURE FOR APPLYING FOR PROSPECTUS AND APPLICATION FORMS

1. The Application and detailed Prospectus for all Regular Courses can be had from the Special Officer, Institute of Correspondence Courses and Continuing Education, P.O. Calicut University, on payment of Rs. 15/- (Rupees Fifteen only) by way of Challan/Demand Draft drawn in favour of the Finance Officer, University of Calicut. Students residing abroad shall send a Demand Draft for Rs. 25/- (Rupees Twenty five only) drawn in favour of Finance Officer, University of Calicut. Challan will be accepted only from candidates residing in Kerala.
2. Cheques, Money Orders and Postal Orders will not be accepted.

P.P. Kunhikrishnan
SPECIAL OFFICER

AIU Library & Documentation Services

One of the important functions of the Association of Indian Universities is to act as a clearing house of information on higher education in the country. Towards this end the AIU Library is engaged in collection building and developing instruments for the dissemination of research information. Over the years a valuable collection of books and documents on different aspects of higher education has been acquired.

The Library has also developed Bibliography of Doctoral Dissertation as an effective tool in the dissemination of research information. Retrospective bibliographies covering the period 1857-1970 and 1970-75 were the first to appear. Effective 1975, however, the bibliography is issued annually in two volumes. One volume deals with Natural and Applied Sciences while the other records doctoral degrees awarded in Social Sciences and the Humanities. In addition to the normal bibliographical details like the name of the Research Scholar, the title of the thesis, years of registration for and award of the degree, and the name of the University accepting the thesis for award of a doctoral degree, the bibliography also gives name and complete address of the supervising teacher and an availability note that seeks to inform whether a copy of the dissertation is available for consultation and use in the University Library/Department or Registrar's Office.

The columns 'Theses of the Month' and 'Research in Progress' are intended to cut out the time lag between the receipt of information and its inclusion in bibliography. Such Universities as are not sending us regular information in respect of Doctoral Theses accepted and research scholars enrolled are welcome to make use of these columns.

• The Library is open from 9.00 a.m. to 5.30 p.m. Monday through Friday.

CURRENT DOCUMENTATION IN EDUCATION

A List of Select Articles Culled from Periodicals received in the AIU Library during September, 1989.

EDUCATIONAL PHILOSOPHY

Arnold, Peter. On the relationship between education, work and leisure: Past, present and future. *British J Ednl Studies* 37(2), 1989, 136-46.

Miller, Ralph M. Ethics, development, education. *Prospects* 18(4), 1988, 445-58.

Thompson, Dennis F. Liberty and higher education. *Educational Record* 70(2), 1989, 10-15.

EDUCATIONAL SOCIOLOGY

Altbach, Philip, G. Perspectives on student political activism. *Comp Edn* 25(1) 1989, 97-110.

Saldanha, Denzil. Socialisation of critical thought: Responses to illiteracy among the adivasis in Thane District. *Eco Pol Weekly* 24(30), 1989, PE 54-61.

EDUCATIONAL ADMINISTRATION

Birnbaum, Robert. Presidential succession and institutional functioning in higher education. *J Hr. Edn* 60(2), 1989, 123-35.

Sloper, D.W. The legal and formal basis to the office of vice-chancellor in Australian universities. *HR Edn* 18(1), 1989, 180-208.

Volkwein, J. Fredericks. Changes in quality among public universities. *Jr Hr. Edn* 60(2), 1989, 136-51.

CURRICULUM

Stunkel, Kenneth R. Obstacles and pathways to coherence in the humanities. *J Hr. Edn* 60(3), 1989, 325-48.

TEACHERS & TEACHING

Chauhan, C.P.S. Recruitment and professional growth of university teachers : Needed a policy. *J Indian Edn* 14(3), 1988, 49-53.

Kagan, Dona M. Teaching as clinical problem solving : A critical examination of the analogy and its implications. *Rev Ednl Res* 58(4), 1988, 482-505.

Wadhera, R.C. Career of language : Problems, pitfalls and perspectives. *J Indian Edn* 14(3), 1988, 2-6.

Williams, Gwen B and Zinkel, Perry A. Academic penetration in faculty collective bargaining contracts in higher education. *Res Hr Edn* 28(1), 1988, 76-92.

EDUCATIONAL TECHNOLOGY

Bander, David A. Combining a computer simulation with a laboratory class : The best of both worlds ? *Comput Edn* 13(3), 1989, 235-43.

EDUCATIONAL EVALUATION

Dura, Jason R and others. Stability of the wide range achievement test in an adolescent psychiatric inpatient setting. *Ednl Psy Measurement* 49(1), 1989, 253-56.

Fraser, Barry J. Educational evaluation in Australia. *Studies Ednl Eval* 15(1), 1989, 3-6.

Kurz, Richard S. and Others. Faculty performance: Suggestions for the refinement of the concept and its measurement. *J Hr. Edn* 60(1), 1989, 43-58.

McDonald, Roderick P. Future directions for item response theory. *Int J Ednl Res* 13(2), 1989, 205-220.

Millman, Jason and Westman, Ronald S. Computer-assisted writing of achievement of test items: Towards a future technology. *JEM* 26(2), 1989, 177-90.

Ory, John C. and Braskamp, Larry. Involvement and growth of students in three academic programs. *Res Hr. Edn* 28(2), 1988, 116-29.

Sonnichsen, Richard C. Advocacy evaluation: A strategy for organisational improvement. *Knowledge* 10(4), 1989, 243-259.

ECONOMICS OF EDUCATION

Chabotar, Kent John. Financial ratio analysis comes to nonprofits. *J. Hr Edn* 60(2), 1989, 188-208.

Dolton, Peter J. The finance of university computing. *Studies Hr Edn* 14(2) 1989, 183-200.

Gullason, Edward T. The consumption value of schooling: An empirical estimate of one aspect. *J Human Resources* 24(2), 1989, 287-98.

Stapleton, David C. Cohort size and the academic labor market. *J Human Resources* 24(2), 1989, 221-252.

SCIENCE EDUCATION

Karen J. Sy. As scientists and citizens *Knowledge* 10(4), 1989, 280-303.

Moravcsik Michael J. The ultimate bottleneck. *Minerva* 27(1), 1989, 21-32.

VOCATIONAL EDUCATION

Lindbekk, Tore. 'Education for life', vocational education and social integration in Norway. *Comp Edn* 25(1), 1989, 19-28.

Sharma, R.K. Role of agricultural universities. *Yojana* 33(9), 1989, 4-17.

ADULT EDUCATION

Nowlan, Philip M. Continuing education: Two perspectives. *Ednl Record* 70(2), 1989, 46-7.

Wright, Peter. Access or exclusion? Some comments on the history and future prospects of continuing education in England (1). *Studies Hr Edn* 14(1), 1989, 23-40.

DISTANCE EDUCATION

Arger, Geoff and Clayton, Debbie. The use of computers in the instructional process in Australian distance education. *Computers Edn* 13(4), 1989, 343-54.

Daniel, John S. Commonwealth of learning opens. *Open Learning* 4(2), 1989, 57-8.

Kember, David. A longitudinal process model of drop-out from Distance Education. *J Hr Edn* 60(3), 1989, 278-301.

Miers, Margaret. Open pedagogy in the open university: Views of tutorial and counselling staff. *Open Learning* 4(2), 1989, 48-50.

Rumble, Greville. 'Open learning' 'distance learning' and the misuse of language. *Open Learning* 4(2), 1989, 28-36.

COMPARATIVE EDUCATION & COUNTRY STUDIES

Ahmed, Ajuji. The asquith tradition, the Ashby Reform and the development of higher education in Nigeria. *Minerv* 27(1), 1989, 1-20.

Hayhoe, Ruth. China's universities and Western academic models. *Hr Edn* 18(1), 1989, 49-85.

Lewin, Keith and Hui, Xu. Rethinking revolution: reflections on China's 1985 educational reforms. *Comp Edn* 25(1), 1989, 7-17.

Wright, Peter W.G. Who defines quality in higher education? Reflections on the role of professional power in determining conceptions of quality in English higher education. *Hr. Edn* 18(1), 1989, 149-165.

THESES OF THE MONTH

A List of Doctoral Theses Accepted by Indian Universities

BIOLOGICAL SCIENCES

Anthropology

1. Dharma Rao, Bammidi. *Physical growth among Yadava and Vadabaliya boys of Visakhapatnam: A cross-sectional study*. Andhra.

Environmental Sciences

1. Abbasi, S.A. *Studies in water quality and environmental engineering*. CUST.

2. Jain, Suresh Chandra. *Studies on nitrate and sulphate with special reference to their size distribution in atmosphere*. JNU. Prof. J.M. Dave, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi.

3. Vaihyanathan, P. *Heavy metals distribution's fractionation and deposition in the Cauvery River Basin*. JNU. Prof. V. Subramanian, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi.

Marine Biology

1. Mathew, Anney K. *Studies on some aspects of biology of two estuarine fishes Megalops cyprinoides and Scatophagus argus*. CUST. Dr. A. Antony, Reader, School of Marine Sciences, Cochin University of Science and Technology, Cochin.

2. Pushpendra. *Hydrobiological studies of a pond*. Managalore. Prof. M.N. Madhyastha, Prof. Department of Biosciences, Managalore University, Mangalagangotri.

3. Sundaresan Pillai, J. *Studies on siltation in Cochin Harbour Dynamics of suspensate.* CUST. Dr. P.N. Krishnan Nambisan, Director, School of Marine Sciences, Cochin University of Science and Technology, Cochin.

Biochemistry

1. Azmes, Arshad Rehman. *Studies on the interaction of chemical carcinogens with macromolecules.* AMU. Prof. S.M. Hadi, Reader, Department of Biochemistry, Aligarh Muslim University, Aligarh.

2. Basu, Asitabha. *Pharmacological and biochemical studies on the venom of the scorpion *Lychas laevifrons* Pock.* Calcutta.

3. Gupta, Amita. *Immunological studies on human chorionic gonadotropin.* AMU. Prof. Rashid Ali.

4. Harinarayana Rao, S. *Effect of the early malnutrition on diet induced thermogenesis.* Osmania,

5. Khan, M. Tariq *Studies on some unusual properties of goat erythrocyte membrane.* AMU. Prof. M. Saleemuddin, Reader, Department of Biochemistry, Aligarh Muslim University, Aligarh.

6. Khanna, Raka. *Vaccination studies in simian *Malaria* a model using immuno-modulators.* AMU. Prof. Sohail Ahmad.

7. Manjula, V. *Biochemical studies in sex linked myopathies.* Osmania.

8. Patil, Mukund Deorao. *Prevalence and persistence of enteric pathogens in water.* NEERI, Nagpur. Dr. N.M. Parhad, Scientist, National Environmental Engineering Research Institute, Nagpur.

Microbiology

1. Nanu, Etty. *Bacteriological quality of pork products with special reference to staphylococcal enterotoxins.* Birsa Agrl.

Botany

1. Agarwal, Kalpana. *Comparative effects of copper cellular components in different eukaryotic systems.* Calcutta.

2. Amarjeet Kaur. *Somaclonal propagation of some leguminous trees.* HAU.

3. Balakista Reddy, G. *Ecological studies in the River Kagna near Tandur (A.P.) with special reference to water quality and pollution.* Osmania.

4. Bhattacharya, Dinendranath. *Studies on effect of metal-ions on nodule bacteria and nodulations of chick-pea, *Cicer arietinum* L. in lateritic soil of Birbhum District.* Visva Bharati. Dr. S.C. Pal, Department of Botany, Visva Bharati, Santiniketan.

5. Bhattacharyya, Subires. *Potential use of bio-degradable animal waste in mass cultivation of algae and the extent of damage caused by pollutants in relation to productivity.* Calcutta.

6. Chintalapati, Venkata Ramana. *Screening of blue-green algae for biomass and hydrogen photoproduction with particular reference to *synechococcus* spp.* Osmania.

7. Das, Anathbandhu. *Cytology, induced variability and chemical analysis of some umbelliferous species.* Calcutta.

8. Dasgupta, Madhumita. *In vitro regulation of cell differentiation and morphogenesis in some medicinal plants with special reference to biosynthesis of active principles.* Visva Bharati. Dr. S.K. Dutta, Department of Botany, Visva Bharati, Santiniketan.

9. De, Krishna Chandra. *Studies on the foliar anatomy and seed morphology of some naturally occurring taxa of Euphorbiaceae from Hooghly District, West Bengal, India.* Burdwan. Dr. S.K. Roy, Prof., Department of Botany, University of Burdwan, Burdwan.

10. Deshpande, Ashlesha Anandrao. *Kinetic studies on the action of plant growth regulators and organophosphorus pesticides on the membrane bound hydrolytic enzymes AT Pases.* Karnatak. Dr. G. Shivakumar Swamy, Reader, Department of Studies in Botany, Karnatak University, Dharwad.

11. Gupta, Ashim Kumar. *The urea-hydrolyzing bacteria and their ureases.* Burdwan. Dr. Ajit Kumar Banerjee, Prof., Department of Botany, University of Burdwan, Burdwan.

12. Khan, Faizan Ahmad. *Growth and yield response of *Lens culinaris* (L) Medic and *Vigna radiata* (L) Wilczek to nitrogen, phosphorus and pyridoxine application.* AMU. Dr. Samiullah, Reader, Department of Botany, Aligarh Muslim University, Aligarh.

13. Khan, Mujahid Ali. *Cultivation of *plantago ovata* and *Cymbopogon* spp. with special reference to mineral nutrition.* AMU. Prof. M.M.R.K. Afzidi, Department of Botany, Aligarh Muslim University, Aligarh.

14. Khan, Mujeebur Rahman. *Studies on root-knot nematodes in relation to environmental pollution on some vegetable crops.* AMU. Dr. M. Wajid Khan, Reader, Department of Botany, Aligarh Muslim University, Aligarh.

15. Khan, Sumitra. *A comparative study of the effect of environment on plants under normal and chemical stress conditions.* Visva Bharati. Dr. (Mrs) Malabika Ray, Department of Botany, Visva Bharati, Santiniketan, and Prof. J.J. Ghosh, Department of Biochemistry, Calcutta University, Calcutta.

16. Mishra, Gopal. *Aerobiological studies of some mica mines around Jhumri Telaiya (Hazaribagh) Bihar.* Magadh.

17. Pal, Asit. *Studies on some aspects of edible mushrooms with special reference to the cultivation in hills and plains of West Bengal.* NBU.

18. Shahid Umar. *Potassium nutrition of groundnut under rainfed and irrigated conditions.* AMU. Prof. M.M.R.K. Afzidi, Department of Botany, Aligarh Muslim University, Aligarh.

19. Sharma, Anil Kumar. *Genetic architecture of some quantitative and qualitative attributes in Bengal gram, *Cicer arietinum* L.* HS Gour. Prof. S.C. Agrawal, Department of Botany, Dr. Harisingh Gour Vishwavidyalaya, Sagar and Prof. S.P. Singh, Retd. Dean, 8 Adarsh Nagar, Adhartal, Jabalpur, M.P.

20. Singh, Rajendra Bahadur. *Studies on the response of phosphatic and zinc fertilizer on black gram (Urad).* Awadhesh. Dr. D.C. Nigam, Assoc. Prof., Department of Botany, Govt Model Science College, Rewa, M.P.

21. Sinha, Bhartendu Kumar. *Morphological and cytological studies as an aid in the elucidation of affinities and*

evolution of some angiospermic taxa and the effects of some pesticidal chemicals on plant chromosomes. Visva Bharati. Prof. G.N. Bhattacharya, Department of Botany, Visva Bharati, Santiniketan.

22. Vyawahare, Suresh Vasantrao. Mycophysiological studies on some fungi imperfecti causing leaf spot diseases. Amravati. Dr. J.L. Shreemali, Principal, Brijlal Biyani Science College, Amravati.

Agriculture

1. Harminder Jit Singh. Agronomic studies on the seed production of ryegrass, *Lolium perenne L.* PAU.

2. Mohindra, Vindhya. Cytogenetical behaviour and disease resistance studies in the interspecific crosses in the genus *Beneis etum*. PAU.

3. Pawar, Bhaskar Baliram. Study of transgressive segregants in pearl millet *Pennisetum americanum* (L) Leeke. MP Agri. Dr. R.Y. Thete, Assoc Prof., Department of Botany, Mahatma Phule Agricultural University, Rahuri.

4. Rajdeo Singh. Irrigation requirement of paddy based cropping sequences. RAU.

5. Sadhu, Supriya Kumar. Genetic architecture of yield and its components in chickpea, *Cicer arietinum L.* Visva Bharati. Dr. A.K. Mondal, Institute of Agriculture, Visva Bharati, Santiketan.

6. Sharma, Durga Datt. Effect of different rootstocks and training systems on growth, cropping, nutrients status and water relations of apple trees. YS Parmar. Dr. J.M. Singh, Department of Fruit Culture and Orchard Management, College of Horticulture, Solan.

7. Sharma, Ramakant. Effect of foliar feeding to potassium, calcium, zinc and GA on yield and quality of guava, *Psidium guajava L.* RAU.

8. Sudheer Kumar. Studies on root rots of *Populus* species. YS Parmar, Dr. V.K. Gupta, Department of Mycology and Plant Pathology, College of Horticulture, Solan.

9. Tarlok Singh. Biology and control of *Ischaemum rugosum* Salisb in Rice. PAU.

Zoology

1. Basak, Prabir Kumar. A study of the store product beetles (Insecta: Coleoptera) of Calcutta and its vicinity. Burdwan, Dr. Deb Kumar Choudhuri, Prof., Department of Zoology, University of Burdwan, Burdwan and Dr. T. Sengupta, Scientist 'SE', Zoological Survey of India, Calcutta.

2. Bhagya Lakshmi, K. Chromatographic, enzymatic and colorimetric methods for select hazardous environmental contaminants with special reference to cyanide poison in medicinal drugs. Venkateswara Dr. N.V. Nanda Kumar, Department of Zoology, Sri Venkateswara University, Tirupati.

3. Bhosale, Subhas Hanamantappa. Some aspects of physiology of reproduction in the silkworm, *Bombyx Mori*. Karnatak. Dr. V.L. Kaliapur, Reader, Department of Studies in Zoology, Karnatak University, Dharwad.

4. Chowdhary, Mashkoor Ahmad. Evaluation of biological models for detection of enteotoxin (S) of *Escherichia Coli*.

AMU. Prof. Ather H. Siddiqi, Prof. and Head, Department of Zoology, Aligarh Muslim University, Aligarh.

5. Ennerjeet, Brij Chand. Studies on the migratory behaviour of *Agrotis Ipsilon Hufnagel* based on the analysis of light trap catches. Durgawati. Dr. S.C. Pathak, Reader, and Dr. R.C. Rajak, Reader, Department of Biological Sciences, Rani Durgawati Vishwavidyalaya, Jabalpur.

6. Hanumantha Raju, P. Some aspects of neuroendocrine regulation of energy metabolism in aestivated snail. Venkateswara, Dr. P. Reddanna, Department of Zoology, Sri Venkateswara University College, Tirupati.

7. Jyothi, P. Aran. Studies on the pattern of changes in female reproductive physiology of Albino rats associated with physical exercise. Venkateswara. Dr. S. Govindappa, Department of Zoology, Sri Venkateswara University College, Tirupati.

8. Kabra, Rajkumar Amarchand. Physiological response of the fresh water fish *Channa Orientalis* (Sch) to pollution. Amravati. Dr. K.M. Kulkarni, Lecturer in Zoology, Govt. Vidarbha Mahavidyalaya, Amravati.

9. Kupwade, Vijaykumar Apparao. Some studies on the endocrine aspects of the female frog *Rana Cyanophylctis* (Schn) in relation to reproduction. Karnatak. Dr. S.K. Saidapur, Prof., Department of Studies in Zoology, Karnatak University, Dharwad.

10. Maya Devi, T. Mast cells as targets to organic dusts and organic chemicals. Venkateswara. Dr. K. Indira Sriram, Department of Zoology, Sri Venkateswara University College, Tirupati.

11. Mukhopadhyay, Sakuntala. The histochemistry and fine structure of the coleonyctes of *Phretilma postuma*. Calcutta.

12. Nandi, Saumen. Ecology of benthic gastropods in the littoral mudflats of Hooghly Estuary, India. Calcutta.

13. Nigar Sulthana, R. Regulation of certain glycolytic events in denervation hypertrophy by electropolarity treatment. Venkateswara. Dr. (Mrs) K. Indira Sriram, Department of Zoology, Sri Venkateswara University College, Tirupati.

14. Perumallu, K. Raghava. Metabolic alterations during induced ammonia stress in selected tissues of toad, *Bufo melanostictus*. Venkateswara. Dr. P. Neeraja, Department of Zoology, Sri Venkateswara University College, Tirupati.

15. Santha, P.C. Studies on the effects of hormones, hormone analogues and antihormones on *Spodoptera mauritia boisd* (Lepidoptera: Noctuidae). Calicut. Dr. V.S. Krishnan Nair, Reader, Department of Zoology, University of Calicut, Calicut.

16. Sinha, Arun Kumar. Studies on the alimentary canal and reproductive organs of *Aulacophora atripennis* (Fabr) (Chrysomelidae: Coleoptera). Magadh.

17. Sinha, Debasish. Ethno-zoological studies of the sub-Himalayan Tribal area of North Bengal with emphasis on ecology and bioenergetics of the toads. NBU.

Medical Sciences

1. Arora, Naveen. Studies on modified allergens. Delhi.

2. Duragkar, Nandkishor Jiwanrao. Pharmacognostical studies on some members of Euphorbiaceae. Nagpur. Dr.

A.N. Saoji, Department of Pharmaceutical Sciences, Nagpur University, Nagpur.

3. Ghosh, Debasish. *A study on the effects of heat on spermatogenesis.* Calcutta.

4. Kambadur, Nirmala. *Studies on an antigen isolated from mycobacteria.* Delhi.

5. Kaul, Rashmi. *Studies on the immune response to Klebsiella in sero-negative spondarthritis syndrome (HLABs) related reactive arthropathies.* Delhi.

6. Kulkarni, Bhanudas Gopal. *Studies of some electrical properties of O/W emulsions.* Nagpur. Dr. A.K. Dolre, Prof., Department of Pharmaceutical Sciences, Nagpur University, Nagpur.

7. Mehta, Dolly. *Studies on leukocyte metabolism to understand the mechanism underlying, B-Adrenergic subsensitivity and failure of Na/K and Ca pumps in asthma.* Delhi.

8. Palanichamy, S. *Cassia alata : A study on its pharmacognosy, phytochemistry, pharmacology and formulation.* Bharathidasan.

9. Sriramakrishna, N. *The hypothalamus of the cat fish Clarias batrachus (Linn) : Some neuroanatomical and neurohormonal aspects.* Nagpur. Dr. N.K. Subhedar, Department of Pharmaceutical Sciences, Nagpur University, Nagpur.

10. Tripathi, Meena. *Synthesis and evaluation of some biosurfactants.* HS Gour. Dr. D.V. Kohli, Lecturer, Department of Pharmaceutical Sciences, Dr. Harisingh Gour Vishwavidyalaya, Sagar.

Veterinary Sciences

1. Chanda, Amalendu. *Certain physiopharmacological investigations of 5-hydroxytryptamine and prostaglandins in chicks.* Calcutta.

2. Rawat, Jagveer. *Characterisation of Lymphoid cells and monocytes of buffalo, Bubalus Bubalis.* HAU.

3. Sharma, Ashwani Kumar. *Blood biochemical constituents and fertility traits in buffaloes, Bos bubalis in relation to varying levels of nutrition during prepartum and postpartum Period.* PAU.

WITH BEST COMPLIMENTS FROM



Vijayalakshmi Printing Works

Specialists in :

PHOTO-TYPESETTING • OFFSET PRINTING • COLOUR JOB • ANNUAL REPORTS

SOUVENIRS • POSTERS MAGAZINES • FOLDERS IN
ENGLISH • HINDI • MALAYALAM • TAMIL

K-6 MAIN BAZAR, LAKSHMI NAGAR, DELHI-110052

Press : 2242745 2240353 Res : 2242387



Madhavan Paper Co. Pvt. Ltd.

Manufacturers & Suppliers of :

FLOPPIES RIBBONS RE-FILLS &
COMPUTER CONTINUOUS STATIONERY
N-100 C, CONNAUGHT PLACE, NEW DELHI-110001
Phone : 3313258

GURU NANAK DEV UNIVERSITY PUBLICATIONS

LIST OF ENGLISH BOOKS

Sr. No.	Name of the Publication	Total Pages	Price Per Copy	Delux Rs. P.	Paper Back Rs. P.
1.	Christopher Marlowe (A Study of Major Plays) (by Ghansham Sharma)	192	54.00	—	
2.	Edith Wharton : A Study of Her Ethos and Art (by G.S. Rahi)	194	80.00	—	
3.	Six Indian Novelists in English (by Ramesh K. Srivastava)	359	100.00	—	
4.	Graham Greene : An Existentialist Investigation (by Dr. Satnam Kaur)		80.00	—	
5.	The City and Its Slums—A Sociological Study (by R.S. Sandhu)		80.00	—	
6.	Early Nineteenth Century Punjab (by Dr. J.S. Grewal & Dr. Indu Banga)	204	25.00	—	
7.	Studies in Urban History (by Dr. J.S. Grewal & Dr. Indu Banga)	210	42.00	35.00	
8.	Maharaja Ranjit Singh and His Times (by Dr. J.S. Grewal & Dr. Indu Banga)	296	46.00	38.60	
9.	Punjabis in New Zealand (by Dr. W.H. McLeod)	198	70.00	—	
10.	Painter of the Divine : Sobha Singh (Ed. Dr. Madanjit Kaur)	400	150.00	—	
11.	A Jurisdical Study of the Land Reforms Legislation in Post-Independence Punjab (By V.P. Dubey)	332	140.00	—	
12.	From Guru Nanak to Maharaja Ranjit Singh : Essays in Sikh History (Revised Edition) (by Dr. J.S. Grewal)	198		30.00	
13.	The B-40 Janam Sakhi (Translated by W.H. McLeod)	272	70.00	60.00	
14.	The Ballad of God and Man (by Sohan Singh)	152	34.00	24.00	
15.	Golden Temple : Past and Present (by Dr. Madanjit Kaur)	280	80.00	70.00	
16.	Sikh Concept of the Divine (by Prof. Pritam Singh)	284		48.00	
17.	B-40 Janam Sakhi Guru Baba Nanak Paintings (by S.S. Hans)		500.00 (Delux (Imp. Paper) 200.00 P. Back (Imp. Paper) 100.00 (Indian Art Paper)		
18.	Civil and Military Affairs of Maharaja Ranjit Singh (by J.S. Grewal and Indu Banga)			150.00	
19.	Studies in India's Foreign Policy (Revised Edition) (by Dr. Surendra Chopra)	564	100.00	—	
20.	Sino-Indian Relations (Ed. by Surendra Chopra)	196	70.00	—	
21.	Pakistan-China Relations (1958 to 1968) (by Gurnam Singh)	272	90.00	60.00	
22.	Political Dynamics and Crisis in Punjab (by Paul Wallace and Surendra Chopra)	600	160.00	—	
23.	Resource Mobilisation and Economic Development : A Regional Perspective (by P.S. Raikhy and S.S. Gill)	227	75.00	65.00	
24.	India and the New International Economic Order (by Dr. Santokh Taneja)	327		100.00	
25.	PARASHARAPRASHNA (by Kapur Singh), eds. Dr. Piar Singh & Madanjit Kaur		120.00		
26.	Statutory Regulations of Religious Affairs in India : with Special Reference to Sikh Gurdwaras (by Dr. Kashmir Singh)		160.00		
27.	Dramatic Elements in Donne's Songs & Sonnets (by Dr. Rita Chaudhary)		80.00		

M.B.A. ADMISSION ANNOUNCEMENT

VIKRAM UNIVERSITY, UJJAIN

Offers in the Nehru Centenary year a unique opportunity to build a career in Management Studies. Join two years full time Master of Business Administration (M.B.A.) Course '89-91 Starting from 1st December, 1989

AT

Pandit Jawaharlal Nehru Institute of Business Management,
University Compus, Ujjain (M. P.) 456010

Applications are invited for non-residential full-time two years Post-Graduate Programme leading to Master's Degree in Business Administration (M. B. A.) approved by All-India Board of Technical Education and University Grants Commission.

Blank application form for entrance test along with the Information Bulletin will be available from the Institute's office from 25-9-1989 on payment of Rs. 60/- (Rs. Sixty only) through an Account Payee crossed bank draft only drawn in favour of the Director, Pandit Jawaharlal Nehru Institute of Business Management payable at Ujjain. Application form by post will be issued upto 16-10-89 only.

Students who have passed the qualifying first degree/post graduate examination in second division in any discipline with atleast 50% marks in aggregate (45% marks for SC/ST Candidates) are eligible for admission to the M. B. A. Programme. The candidates must attach certified true copies of mark-sheets of all Board and University examinations along with prescribed applications for entrance test.

Eligible candidates will have to appear for a written entrance test at Ujjain. Candidates securing 40% or above marks in the written test will only be qualified for inclusion of their names in order of merit in the Merit-list. Candidates coming in Merit-list of 60 candidates as specified in the Information Bulletin will have to appear for Group Discussion and Personality (interview) Test at Ujjain as per schedule given below.

1. Despatch of Admit Card for Entrance Test by Post to eligible candidates.	31.10.89
2. Date and Time of Entrance Test	12.11.89 at 9.00 A.M.
3. Declaration of Written test Merit-list	14.11.89 at 11.00 A.M.
4. Group Discussion and Personality Test for Candidates as per Merit-list.	[14.11.89 from 2.00 P.M. 15.11.89 at 9.00 A.M.]
5. Declaration of final Merit-list of 30 candidates eligible for admission for M.B.A. Course.	16.11.89 at 3.00 P.M.

Out-station candidates may come with proper arrangements to stay at Ujjain for six days at their cost, if need be.

Multi-step Entrance Test is designed to assess the candidate's ability in verbal reasoning, quantitative reasoning, data interpretation, Mathematical comprehension, English knowledge and comprehension. The medium will be English only.

Total number of seats will be Thirty only out of which reservation of seats will be 4 for SC, 2 for ST and one for handicapped candidates meeting the admission requirements of the University.

Duly completed application form in all respects must reach the Director, Pandit Jawaharlal Nehru Institute of Business Management, Humanities Block, Vikram University, Ujjain - 456010 (M.P.) on or before 21.10.89. Application received after the last date or incomplete application will not be considered and no refund claim will be entertained on any ground what so ever.

Entrance test fee of Rs. 100/- only will be payable along with the application form for the test through an Account Payee crossed bank draft only drawn in favour of the Director, Pandit Jawaharlal Nehru Institute of Business Management payable at Ujjain.

Applications without the minimum requirements of qualifications and requisite entrance test fee will not be considered.

R.C. Parmar
REGISTRAR



INDIAN INSTITUTE OF TECHNOLOGY MADRAS.

INVITES APPLICATIONS for the following positions in the pay scales noted. The scales of pay are likely to be revised. The figures given in parentheses against each category are the approximate gross emoluments including HRA at the minimum of the present scale of pay.

1. PROFESSOR

Rs. 1500-60-1800-100-2000-125/2-2500
(Rs. 4963.00)

2. CHIEF DESIGN ENGINEER

Rs. 1500-60-1800-100-2000 (Rs. 4963.00)

3. ASSISTANT PROFESSOR

Rs. 1200-50-1300-60-1900. (Rs. 4481.00)

4. LECTURER

5. SENIOR SCIENTIFIC OFFICER-II

Rs. 700-40-1100-50-1600. (Rs. 3064.50)

6. INSTRUMENT ENGINEER

Rs 700-40-900-EB-40-1100-50-1300
(Rs. 3064.50)

The posts of Lecturer and Senior Scientific Officer-II are reserved for SC/ST candidates. If suitable candidates are not available, the posts will be treated as dereserved.

Other things being equal, preference will be given to the SC/ST candidates for the post of Chief Design Engineer.

Posts are permanent or likely to become permanent. Besides pay, posts carry allowances and retirement benefits as per Institute rules. Higher initial pay is admissible to exceptionally qualified and deserving candidates. Candidates called for interview will be paid railway fare from the place of their duty/residence to Madras and back by shortest route as per Institute rules.

Qualification & Experience

1. Professor :

(a) A good academic record with Bachelor's or Master's degree in the relevant area. A doctorate degree in any of the specialisations mentioned or closely related area is *essential*.

(b) 10 years' experience in the field of specialisation prescribed of which at least five years should be in teaching and/or research (for Engineering and Humanities & Social Sciences Departments/Centres)

OR

10 years' teaching and/or research experience in the field of specialisation prescribed. Teaching experience desirable (for Science Departments).

C. Research work published in journals of repute.

(d) Experience in guiding research.

2. Chief Design Engineer

A good academic record with Bachelor's or Master's degree in Engineering. A Doctorate degree in the specialisation mentioned is essential.

10 years' relevant professional experience in the field of specialisation out of which 5 years should be in research, design & development work in the area of FRP structures.

Industrial consultancy experience essential. Must have good contacts with industry.

3. Assistant Professor

(a) A good academic record with Bachelor's or Master's degree in the relevant area. A Doctorate degree in any of the specialisations mentioned and related areas is *essential*.

(b) 5 years' experience in the field of specialisation prescribed of which atleast 2 years should be in teaching and/or research (for Engineering and Humanities & Social Sciences Departments/Centres)

OR

5 years' teaching experience in the field of specialisations prescribed. Teaching experience desirable (for Science Departments).

(c) Research work of good quality published in journals of repute.

(d) Experience in guiding research.

4. Lecturer

(a) A good academic record with a Master's degree in Engineering

OR

A doctorate degree in Science in the relevant area.

(b) 2 years' industrial/research experience in the related fields.

5. Senior Scientific Officer-II

A good Bachelor's degree in Engineering with 2 years industrial/research experience in the related fields.

6. Instrument Engineer

A good Bachelor's degree in Electronics & Communication Engineering with 2 years experience in maintenance of highly sophisticated electronic equipment, design and development of analog & digital circuits and handling transducers, signal conditioners & microprocessors, etc.

Departments and Fields of Specialisations :

1. Chemistry Department :

For Assistant Professor :
Catalysis

Selenium Bio-chemistry & Methanogenesis
Inorganic Chemistry of Heterocyclics & Polymers
Organic Chemistry
For Lecturer :
Radioanalytical Chemistry
Analytical Chemistry and Co-ordination Chemistry
Organic Chemistry

2. Humanities & Social Sciences :
For Professor :
Modern Indian History
For Assistant Professor/Lecturer :
Industrial Engineering/Management with specialisation in Production Management

3. Mathematics :
For Assistant Professor :
Applied Probability/Stochastic Processes

4. Physics :
For Professor :
X-Ray Crystallography Thin Film Physics
For Assistant Professor :
Applied Optics
Experimental Solid State Physics

5. Applied Mechanics :
For Professor :
Random vibration/Acoustics & Machinery
Noise
For Lecturer :
Instrumentation for Vibration Noise/Tribology & Dynamics.

6. Chemical Engineering :
For Assistant Professor/Lecturer :
Chemical Reaction Engineering
Environmental Engineering
Process Control and Instrumentation

7. Civil Engineering :
For Professor :
Soil Dynamics & Machine Foundations
Transportation Engineering
For Assistant Professor/Lecturer :
Geotechnical Engineering and Rock Mechanics
Computational Structural Dynamics and Earthquake Engineering
Building Technology and Construction Management.

8. Electrical Engineering :
For Professor :
Robotics/Control Engineering
Surface Acoustic Waves & Communication Networks.
For Assistant Professor/Lecturer :
Fibre Optic Communication and Optical Signal Processing
VLSI Design
Communication Engineering
Robotics and Robo Vision
Image Processing
For Senior Scientific Officer-II :
Communication System and Signal Processing
Instrumentation and Measurements

9. Mechanical Engineering :
For Professor :
Thermodynamics & Solar Energy
Heat Transfer
Combustion & Propulsion

Machine Design—New Materials.
10. Ocean Engineering Centre :
For Lecturer :
Ship Design
Marine Foundations
Offshore & Coastal Structures
Wave Hydrodynamics.

11. FRP Research Centre :
For Chief Design Engineer :
Composites Technology

12. Central Electronics Centre :
For Instrument Engineer
Digital Electronics & Microprocessing.

GENERAL INFORMATION/CONDITIONS/INSTRUCTIONS

- (i) For all posts where postgraduate qualification is prescribed experience means experience gained after successful completion of Master's degree.
- (ii) The prescribed qualifications are minimum and the mere fact that a candidate possesses the same will not entitle him/her for being called for interview.
- (iii) The Institute reserves the right to restrict the number of candidates for interview to a reasonable limit on the basis of qualifications and experience higher than the minimum prescribed in this advertisement.
- (iv) The Institute also reserves the right of rejecting any or all the applications without assigning any reasons therefor.
- (v) Attested copies of certificates in support of claims in respect of age, qualifications, experience etc., should be sent along with the applications failing which such claims will not be accepted and application will be rejected. No correspondence with the applicant will be made in this behalf.
- (vi) Persons in the service of Government Establishments, Public Sector Undertakings should apply through proper channel.
- (vii) Separate application has to be filed for each post.
- (viii) Canvassing in any form will be a disqualification.

For application forms please address the Registrar Indian Institute of Technology, Madras 600 036 with a self addressed, stamped (Re. 1.00) envelope (26×11 cm). The cover must be superscribed "Requisition for Application Form for the Post of.....". Indian Nationals abroad may apply for faculty positions on plain paper with full details of educational qualifications, research experience and names and addresses of three referees from whom reference letters may be obtained.

Completed applications with a crossed non-refundable current Indian Postal Order of the value of Rs. 7.50 (Re. 1.90 for SC/ST candidates) drawn in favour of the Institute payable at IIT Madras P.O., superscribing on the cover "APPLICATION FOR THE POST OF....." should be sent to the Registrar of the Institute.

The last date for receipt of completed applications is 6th November, 1989.

REGISTRAR

NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

SPECIAL RECRUITMENT DRIVE FOR SC ST CANDIDATES

Applications on plain paper are invited from the candidates belonging to SC/ST categories (as the case may be) for the following posts. Bio-data may be filled indicating (1) Post applied for (2) Full name of the applicant (in capital letters) (3) Complete postal address (4) Date of birth (5) Whether belongs to SC/ST (6) Educational/professional qualifications (7) Experience (give full particulars of post and present nature of experience, etc. The envelope should be marked "Special Recruitment Drive for SC/ST" and sent to the address indicated at the end of this advertisement. Separate applications should be submitted for each post. Those employed in Govt./Semi-Govt./Autonomous organisations should send the application through proper channel.

1. Lecturer : Two posts (Reserved for SC) (1) One in Botany (2) One in Agriculture. **Qualifications** : (a) A Doctoral degree or research work of an equally high standard, and (b) Good academic record with at least second class ('C' in the seven point scale) Master's degree in the relevant subject from an Indian University or an equivalent degree from a foreign University.

Provided that if the Selection Committee is of the view that the research work of a candidate as evident either from his thesis or from his published work is of very high standard, it may relax any of the qualifications prescribed in (b) above.

Provided further that if a candidate possessing a Doctoral degree or equivalent research work is not available or is not considered suitable, a person possessing a good academic record (weightage being given to M. Phil or equivalent degree or research work of high quality) may be appointed provided he/she has done research work for at least two years or has practical experience in a research laboratory/organisation on the condition that he/she will have to obtain a Doctoral degree or give evidence of research of high standard within eight years of his/her appointment, failing which he/she will not be able to earn future increments until he/she fulfils these requirements.

Pay Scale : Rs. 2200-4000. **Age** : Below 35 years as on 1.8.89.

2. Headmaster : One post (Reserved for ST) to be posted in any of the D.M. Schools attached to the Regional College of Education of NCERT. **Qualifications** : **Essential** : (a) A master's degree with at least 45% marks in Mathematics, Physics, Chemistry, Zoology, Botany, English, Hindi, Sanskrit, History, Geography, Commerce or Economics. (b) A degree or Post-Graduate diploma in Teaching/Education. (c) Three years' experience in educational administration in addition to at least four years' teaching experience in a recognised High/Higher Secondary School or College (d) Working knowledge of Hindi and English. **Desirable** : Experience in organising seminars, in-service courses, symposia, educational conferences, sports, rallies, cultural and literary meets.

Pay Scale : Rs. 3000-4500. **Age** : Between 35 to 50 years as on 1.8.89.

3. TV Producer GR. II : One post (Reserved for ST) **Qualifications** : (a) Degree from a recognised University (b) Diploma in Film Direction or TV Production from a recognised institute or three years' experience in direction/production of film/TV programmes.

Pay Scale : Rs. 1640-2900. **Age** : 35 years as on 1.8.89.

Note : There is no age limit for the employees of the Council. Age concession allowed for SC/ST candidates as per Govt. of India instructions.

Important Instructions : (a) Post is temporary but likely to continue. (b) All employees of the Council can be transferred to any of the establishments of the Council, anywhere in India. (c) If a candidate is found to be of exceptional merit, relaxation of qualifications, experience and age, etc. may be given by the Selection Committee at its discretion. (d) The prescribed qualifications are minimum and mere possession of the same does not entitle candidates to be called for interview, when the number of applications received in response to the advertisement is large, it will not be possible or convenient for the Council to interview all the candidates. The Council may then restrict the number of candidates for interview to a reasonable limit on the basis of qualifications and experience higher than the minimum prescribed in the advertisement.

The last date for receipt of the applications is **13th October, 1989**. Incomplete application will not be entertained under any circumstances. (Advt. No. Tr-4)

Secretary,
National Council of Educational Research and Training
Sri Aurobindo Marg, New Delhi-110 016.

davp 89/680

Publications of Prasaranga, Bangalore University

Prasaranga of Bangalore University, Bangalore has already published about 500 books on regional language text books, criticism, other reference books, many books on Science and Humanities and periodicals.

OUR PERIODICALS ARE

1. JANAPRIYA VIGNANA	Kannada Science Monthly	Annual Subscription	Rs. 12-00
2. SADHANE	Kannada Quarterly (Research Journal)	Annual Subscription (for Students Rs. 5) Life Membership	Rs. 8-00 Rs. 100-00
3. VIDYA BHARATHI	Annual Journal in English (Research Journal of Humanities)	Annual Subscription Life Membership	Rs. 10-00 Rs. 100-00
4. VIGNANA BHARATHI	Annual Journal in English (Research Journal of Science)	Annual Subscription Life Membership	Rs. 10-00 Rs. 100-00
5. BHASHA BHARATHI	Annual Journal in English (Research Journal of Language)	Annual Subscription Life Membership	Rs. 10-00 Rs. 100-00

Please Contact : The Director, Prasaranga, Bangalore University, Bangalore-560 056

Note : For subscription; please send DD/Bank Draft in the name of 'Bangalore University Fund' to The Director of Prasaranga.

Dr. D.M. Nanjundappa
VICE-CHANCELLOR

R.N. Shastri
REGISTRAR

PANJAB UNIVERSITY SELECTED SCHOLARLY TITLES IN ENGLISH

LITERARY CRITICISM

Ghalib and Iqbal by Prof. Ish Kumar	50-00
The Melody of An Angel (Ghalib—His Mind and Art) by Ish Kumar	40-00
Nehru and Indian Literature, De. V.N. Tewari, ed.	50-00

HISTORY

Punjab, Central Asia & the First Afghan War by Dr. Hari Ram Gupta	120-00
Socio-Cultural Impact of Islam on India by Dr. Attar Singh	30-00
Punjab on the Eve of First Sikh War by Dr. Hari Ram Gupta, ed.	50-00
The Jallianwala Bagh Massacre (A Premeditated Plan) by Dr. Raja Ram	25-00
Marathas and Panipat by Dr. Hari Ram Gupta	20-00

INDIAN ART & PHILOSOPHY

An Approach to Indian Art by Dr. Nihar Ranjan Ray	75-00
Indian Idealism and Modern Challenges by Dr. P.T. Raju	10-00
Hinduism and the West by K.M. Panikar	5-00

SIKH HISTORY & PHILOSOPHY

Guru Tegh Bahadur—A Study by Dr. B.S. Gupta	25-00
Philosophy of Guru Nanak by Dr. S.S. Kohli	27-00
Travels of Guru Nanak by Dr. S.S. Kohli	26-00
Guru Nanak in History by Dr. J.S. Grewal	40-00
Guru Gobind Singh : A Biographical Study by Bal & Grewal	30-00
Life of Guru Nanak by Dr. S.S. Bal	60-00
Guru Nanak in the Eyes of Non-Sikhs by Dr. S.S. Bal	60-00

Please Write for Catalogues, Trade Enquiries and Orders to :

SECRETARY, PUBLICATION BUREAU
PANJAB UNIVERSITY, CHANDIGARH

MOST USEFUL UNIVERSITY LEVEL BOOKS FROM PITAMBAR

Mathematics

1. A Text Book of Calculus by S.C. Arora & Ramesh Kumar
2. A Text Book of Differential Equations by N.M. Kapoor
3. A Text Book of Algebra by Ravindra Kumar & S.K. Wasan
4. A Text Book of Coordinate Geometry by P.N. Arora & P.C. Bagga
5. A Text Book of Statistics by N.M. Kapoor
6. Business Mathematics with Applications to Business & Economics by R.S. Soni

Computers

1. COBOL Programming with Business Applications by N.L. Sarda
2. Digital Computer Design Principles by M.R. Bhujade
3. Programming in BASIC by N.L. Sarda
4. Programming in PASCAL by N.L. Sarda
5. Microcomputers : Programming & Utilization by N.L. Sarda
6. Workbook in BASIC by V.B. Aggarwal & M.P. Goel.

Commerce

1. Financial Accounting—Advanced by B.D. Agrawal
2. Elements of Cost Accounting by S.P. Arora & T.S. Soni
3. Cost Accounting—Principles, Practice & Problems by S.P. Arora & T.S. Soni
4. Advanced Cost Accounting by S.P. Arora & T.S. Soni
5. Business Organisation—A Modern Approach by R.K. Lele & J.P. Mahajan
6. Principles of Management by R.K. Lele & J.P. Mahajan
7. Fundamentals of Office Management by J.P. Mahajan
8. Principles and Practice of Auditing by R.P. Maheshwari & B. Singh
9. Business Organisation—A Systems Framework by B. Vardharajan & J.P. Mahajan

English Poetry

1. Spirit's Musings by Prem Kirpal
2. A Flower on the Himalayas by S. Gourhari Singh
3. Initiations by Amita Nahal

Order/Enquiries to :

PITAMBAR PUBLISHING COMPANY

888, EAST PARK ROAD, KAROL BAGH,
NEW DELHI-110005 (INDIA)

SOME GAUHATI UNIVERSITY PUBLICATIONS

Sl. No.	Titles	Authors	Price
1.	Chandra Kanta Abhidhan (Assamese-English Dictionary)	Ed. by Dr. M. Neog Dr. U.N. Goswami	Rs. 200.00
2.	Gurucarita Katha	Ed. by Dr. M. Neog	130.00
3.	Indo-English Poetry	By Dr. P. Kotoky	25.00
4.	Gandhism & Modern India	By N.K. Bose	6.00
5.	A Descriptive Analysis of the Bodo Language	By Dr. P.C. Bhattacharyya	30.00
6.	Concept of Personality in Sankhya-Yoga & the Gita	By Dr. K.C. Das	25.00
7.	Assamese Popular Superstitions & Assamese Demonology	By B. Rajkhowa	7.00
8.	Inscription of Ancient Assam	Ed. by Dr. M.M. Sarma	70.00
9.	Caste as a form of Acculturation	By Dr. S.N. Ratha	17.00
10.	Sanskrit & Allied Indian Studies in U.S.	By Dr. V. Raghavan	20.00
11.	A Study of Culture Change in Two Garo Villages of Meghalaya	By Dr. D.N. Mazumdar	60.00
12.	A Study of Some Traditions of the Performing Arts in Eastern India	By Dr. (Mrs) K. Vatsyana	54.00
13.	Structure of Assamese	By Dr. G.C. Goswami	75.00
14.	Three Decades of the Working of the Indian Constitution	By S.K. Dutta	17.00
15.	Assamese Lessons (Assamese Self Taught)	By Dr. M.M. Sarma	7.00
16.	Asamiya Paribhasha, Vol. I		8.00
17.	Asamiya Paribhasha, Vol. II		6.00
18.	Asamiya Paribhasha, Vol. III		5.50
19.	Asamiya Baijanik Paribhasha, Vol. I		17.00

UNIVERSITY PUBLICATION DEPARTMENT : GAUHATI UNIVERSITY
GUWAHATI-781 014

UNIVERSITY OF KALYANI

LIST OF UNIVERSITY PUBLICATIONS

Sl. No.	Title	Sole Selling Distributors	Price
1.	Bangla Vidya Charcha By Dr. N.R. Sen	M/s. Jijnasa 1/A, College Row, Calcutta.	Rs. 12/-
2.	Charja Geetir Chhanda Parichaya By Dr. N.R. Sen	-do-	Rs. 16/-
3.	Bangla Prabandha Samkalan (Pratham Khanda) Edited By Dr. N.R. Sen	-do-	Rs. 25/-
4.	Milton's Samson Agonistes By Dr. Prabir Sircar	-do-	Rs. 20/-
5.	Bangla Sahitye Pouranik Natak By Dr. R.N. Banerjee	-do-	Rs. 16/-
6.	Gaudiya Vaishnav Darsaner Bhumika By Dr. S.S. Gangopadhyay	M/s. Dey Book Store 13B, Shyamacharan Dey St. Calcutta-12.	Rs. 12/-
7.	The Artists and The City By Sri T. Chattopadhyay	M/s Sarat Book House 18B, Shyamacharan Dey St. Calcutta-700073	Rs. 10/-
8.	Aspects of Human Fertility By Dr. P.K. Chatterjee	M/s K.P. Bagchi & Co. 286, B.B. Ganguly St. Calcutta-700012.	Rs. 75/-
9.	Milton's Samson : A Study in Dramatic Technique. By Dr. P. Sircar	M/s. Jijnasa, 1/A, College Row, Calcutta	Rs. 20/-
10.	Rabindranather Chithi—Parul Devike Compiled by Dr. Kunal Sinha	Naya Prakash 206, Bidhan Sarani Calcutta-700006.	Rs. 30/-

KARNATAK UNIVERSITY, DHARWAD

SOME OF OUR PUBLICATIONS

1.	The Socio-Economic Transformation of India : Dr. Ambedkar's Vision—Ed. A.M. Rajasekhariah	Rs. 15-00
2.	Dr. B.R. Ambedkar and Popular Sovereignty A. Varadarajan	04-00
3.	Religion and Social Determinism and Justice —Cheddi Lal	06-50
4.	Dr. Pavate Educational Administration : Then and Now —V.S. Jha	02-50
5.	Education and Labour Market— Malcolm Adiseshiah	05-00
6.	Legal Theory and Social Change : The Indian Scene —O. Channappa Reddy	05-00
7.	Social Justice : The Crisis of Hypocrisy —V.R. Krishna Iyer	04-00
8.	Women Freedom Fighters in Karnataka —Sarojini Shintri and K. Raghvendra Rao	16-00
9.	National Unity, Equality, Rule of Law and Creating Men of Quality —M. Rama Jois	09-00
10.	Decentralisation of Education—M.V. Kamath	
11.	New Trends in Sanskrit Poetics —B.P. Bhattacharya	09-00
12.	Vakrokti Jivita - Ed : K. Krishnamurthy	40-00
13.	Symposium on Planned Economic Development and the Developmental Programme for Weaker Sections in Karnataka —Ed. A.M. Rajasekhariah	44-00
14.	Akkamahadevi Ke Vachan (Hindi Translation) —Nandini Gundu Rao	18-00

For copies, please write to :

DIRECTOR

Prasaranga, Karnatak University,
Dharwad-580003 (Karnataka State)

SHIVAJI UNIVERSITY, KOLHAPUR

ACADEMIC PUBLICATIONS (In English)

1.	Experimentation with Language in Indian Writing in English-Fiction 1974 Editor, Dr. S.K. Desai	Rs. 5-00
2.	Weekly Markets and Fairs in South Ratnagiri District 1977 Dr. M.D. Tawade	Rs. 5-00
3.	Ecogeographical Studies in Vashisti and Terekhol Rivers 1978 Dr. G.V. Joshi and Dr. S.D. Shinde	Rs. 10-00
4.	Rajarshi Shahu Chhatrapati Papers—Vol-1 1884-1894 (Adoption to Installation) 1978 Dr. A.G. Pawar	Rs. 50-00
5.	Non-Brahmin Movements in Southern India (1873 to 1949) 1979 Dr. K.K. Kawalekar	Rs. 30-00
6.	Studies in Shivaji and His Times 1982 Dr. B.R. Kamble	Rs. 32-00
7.	Rajarshi Shahu Chhatrapati Papers—Vol-2, 1894-1900 A.D. (Early Administrative Reforms) 1983 Editors Dr. Vilas Sangave and Dr. B.D. Khane	Rs. 75-00
8.	Rajarshi Shahu Chhatrapati Papers—Vol-3, 1900-1905 A.D. (Vedokta Controversy) 1985 Editors Dr. Vilas Sangave and Dr. B.D. Khane	Rs. 90.00
9.	Solid State Energy Conversion 1986 Editors S.H. Pawar, C.H. Bhosale, R.N. Patil	Rs. 100-00
10.	The Mangroves 1986 Executive Editor Dr. Leela G. Bhosale	Rs. 200-00
11.	Solar Energy and Rural Development 1988 Editors S.H. Pawar, C.D. Lokhande, R.N. Patil	Rs. 150-00
12.	Energy Resources Through Photoelectrochemical Routes 1988 Editors S.H. Pawar, Ved Mitra, B. Venkataraman	Rs. 125-00

Please Write for Catalogues, Trade Enquiries and Order to :

THE REGISTRAR
SHIVAJI UNIVERSITY
Vidyanagar, Kolhapur-416 004. (India)

S.S.L. JAIN COLLEGE, VIDISHA (M.P.)

(Affiliated to Barkatullah University)

Advertisement No. 2/89

WANTED

Applications are invited for the following posts :

1. One Assistant Professor in English—In regular vacancy
2. One Assistant Professor in Botany—In leave vacancy—upto 31-7-90
Specialization in Genetics or Micro Biology

Qualification

As per M.P.U.S.A. Ayog, Bhopal. Minimum Ph.D. with 2nd or 1st class in postgraduation, 50% at all levels from Hr. Sc./ Inter to graduation. Candidates should be able to teach in English and Hindi.

Pay Scale : As per M.P. Government.—2200-75-2800-100-4000

Application forms can be had from the undersigned on payment of Rs. 10/- Last date for receiving application is 30-10-89.

K.C.Nair
PRINCIPAL

VIKRAM SARABHAI SPACE CENTRE

TRIVANDRUM

ISRO VISITING FELLOWSHIPS

Vikram Sarabhai Space Centre, Trivandrum of the Indian Space Research Organisation, Department of Space, invites applications for ISRO Visiting Fellowships, tenable at the Space Physics Laboratory (SPL). VSSC, from young Scientists below the age of 24 years possessing a First Class Post Graduate Degree in Physics/Applied Physics/Metrology. Students who are expected to complete their M.Sc./M.Tech. final examinations before the end of October, 1989 can also apply stating clearly the expected dates of the examination and the expected date of publication of the result. The selected candidates should have passed the M.Sc./M.Tech. in first class by the time of joining. Selection is based on the performance in a written test and an interview for those candidates who pass the written test. In the test the candidates will be tested in their depth of understanding in the fundamental concepts of Physics and the ability to apply them to solve scientific problems. The test and the interview are likely to take place over a period of 2 days around the last week of November 1989 in VSSC. Trivandrum.

At the Space Physics Laboratory, opportunities for experimental and theoretical research work on the Space environment of the Earth are available in the following areas :

- (i) Electrodynamics of the Ionosphere—Magnetosphere System.
- (ii) Large Scale Dynamics and Wave Motions in the Troposphere, Stratosphere, Mesosphere and Thermosphere.
- (iii) Atmospheric Aerosols (and minor constituents) and their Role in the Scattering, Absorption and Transmission of Radiation in the Atmosphere.
- (iv) Physics of the Atmospheric Boundary Layer.

Experimental facilities in SPL include Laser Systems, VHF Radars, Acoustic Radar and Solar Radiometers for studies on the Earth's atmosphere. Selected candidates will be working under the general guidance of experienced Scientists and Engineers in SPL and they are encouraged to register and complete their Ph.D. during the tenure of their Fellowships (only such persons who have strong aptitude and motivation for research need apply.)

The Fellowships are granted initially for a period of one year and carry an amount of Rs. 1800/- per month and a contingent grant of Rs. 3000/- per year. M.E./M.Tech. Degree holders are eligible for a monthly stipend of Rs. 2400/-, ISRO may renew the Fellowships annually for another three years subject to the total period of the Fellowships not exceeding a period of four years. For M.Sc. degree holders at the end of two years, if the work of the Visiting Fellow is found to be satisfactory after assessment, the amount may be raised to Rs. 2100/- per month. Applications should be sent on A-4 size (210 x 297 mm) plain paper (to be neatly hand-written or typed) alongwith a recent passport size photograph, giving the following details :

- 1. Post Applied for
- 2. Advertisement Number
- 3. Name in full (in block letters)
- 4. Date of birth
- 5. Nationality

- 6. Father's/Husband's name
- 7. Address for correspondence (in block letters)
- 8. Permanent address
- 9. Educational/Professional qualifications (indicating clearly the examinations passed/Course Undergoing, expected dates of examination result, University/Board, Year of passing, Class and Percentage of Marks, Subjects taken). Percentage of marks for all the semesters completed so far are to be given.
- 10. Details of previous/present employment held or Research/Training experience if any, in chronological order starting from present position backwards (indicating the name of employer with full address, post held, salary drawn, period of service, nature of duties).
- 11. If your replies to (9) and (10) do not cover all the period from School leaving till date, briefly state how you spent the uncovered period.
- 12. If selected, the minimum time required to join the Fellowship.
- 13. Any other relevant information including references.
- 14. Whether applied for any post in ISRO/DOS before ? (If so, the details such as name of the Centre, Advertisement No., Post No., Name of Post, Date of interview, Result of interview etc. may be furnished).
- 15. Major Scientific/Technical field(s) of interest : Give details of independent research work (if any).
- 16. List of Publications (if any).

I affirm that information given in this application is true and correct. I also fully understand that if at any stage it is discovered that any attempt has been made by me to wilfully conceal or mis-represent the facts, my candidature may be summarily rejected or my employment terminated.

17. Signature of the candidate with date.

General Conditions

- (a) Candidates will have to produce proof of the details furnished in their applications as and when required.
- (b) Applications which do not give full details asked for and those received after the due date will not be considered.
- (c) Out-station candidates called for the interview will be paid to and fro second class railway fare by the shortest route on production of proof of journey such as railway tickets/ticket number.
- (d) Applications, completed in all respects, should reach the Administrative Officer-II, Recruitment, Vikram Sarabhai Space Centre, Trivandrum-695 022 within 15 days of release of this advertisement. The applications should be sent in a cover superscribed "Application for the award of ISRO Visiting Fellowships"
- (e) Only Indian Nationals need apply.
- (f) No interim correspondence will be entertained.
- (g) Canvassing in any form will be a disqualification.

LIST OF PUBLICATIONS

Central Institute of Higher Tibetan Studies

(Deemed University)

Sarnath, Varanasi, India

1989

BIBLIOTHECA INDO-TIBETICA SERIES :

Tibbati Patbamala : (Tibetan Reader) by Tulku Dhondup. 1976 Rs. 15.00 (hardback) Rs. 10.00 (paperback).

Abhisamayalankaravrtti of Acharya Haribhadra, Tibetan text, Sanskrit restoration and glossary, restored into Sanskrit by Prof. Ram Shankar Tripathi with some Tibetan scholars and an introduction by Prof. S. Rinpoche. 1977. Rs. 85.00 (hb) Rs. 75.00 (pb).

Vajracchedika Prajnaparamita Sutra with the commentary of Asanga : critically edited Sanskrit text, annotated Hindi translation, introduction and glossary by Prof. Lal Mani Joshi with the Tibetan version edited by Prof. S. Rinpoche. 1978. Rs. 60.00 (hb) Rs. 45.00 (pb).

The Biography of Eighty four Saints of Acarya Abhayadatta : critically edited Tibetan text and Hindi translation by Acarya Sempa Dorjee. 1979. Rs. 150.00 (hb) Rs. 130.00 (pb).

Vimalakirtinirdesasutra : critically edited Tibetan text, Sanskrit restoration and Hindi translation, with an introduction, analysis of contents, bibliographies and appendices by Prasadika and Prof. Lal Mani Joshi 1981. Rs. 200.00 hb.

Nyaya Pravesa of Dinnaga with a Haribhadrasuri's commentary and Tibetan text : edited by Acarya Sempa Dorjee. 1983 Rs. 140.00 (hb) Rs. 100.00 (pb).

Bodhipathapradipa of Acarya Dipan-karasrijnana : restored and translated into Hindi and English by Ven. Losang Norbu Shastri. 1984. Rs. 70.00 (hb) Rs. 50.00 (pb).

Sunyatasaptati of Acarya Nagarjuna with auto commentary : critically edited the Tibetan text, Sanskrit restoration and Hindi translation with introduction by Acarya Sempa Dorjee. It contains the Sanskrit and Tibetan versions of Isvara-karitranirakrith of Acarya Nagarjuna with notes as appendices. 1985. Rs. 90.00 (hb) Rs. 65.00 (pb).

Bhavanakramah of Acarya Kamalasila : critically edited Tibetan text and first and third chapters of the original Sanskrit version, and translated into Hindi by Ven. Gyaltsen Nomdol with an introduction, appendices of Tibetan and Hindi versions of Samatha-vipasyana duhsthala jinabhiprayaviparitabha

Bodhipathapradipah of Acarya Dipan-karasrijnana and **Bodhipathakrama-pindartha** of Arcarya Tsongkhapa. 1986 Rs. 1.71.

Vimalaprabhatika (Vol. I) of Kalki Sri Pundarika on Sri Laghukalacakratantraraja by Sri Manjusriyasa : edited by Prof Jagannath Upadyaya with annotations 1986. Rs. 70.00 (hb) Rs. 60.00 (pb).

Digha Nikaya : Reprint of the English translation of the original Pali text published by Burma Pitaka Association with a comprehensive index by Prof. N.H. Samtani. 1987. Rs. 25.00 (hb) Rs. 20.00 (pb).

Anskrit ka Baubha Vaivakarana by Dr. J.P. Dwivedi in Hindi. 1988. Rs. 115.00 (hb) Rs. 90.00 (pb).

Kalapa Vyakarana of Acarya Sarvavarma, edited by Dr. J.P. Dwivedi. The Dhatuspatha, Katwantraparisista and Katantra-vibhrama are brought for the first time in Devanagari character. The book contains five indices and introduction in Sanskrit and Hindi. 1988. Rs. 90.00 (hb) Rs. 75.00 (pb).

Dharma Sangrah of Acarya Nagarjana : Edited and translated into Tibetan by Ven. Gyaltsen Namdol. 1988. Rs. 55.00 (hb), Rs. 45.00 (pb).

THE DALAI LAMA TIBETO-INDOLOGICAL SERIES :

The Social Philosophy of Buddhism. (in English) Editor : Prof. Samdhong Rinpoche, Associate Editor : Sri C. Mani. Rs. 2.00.

Baudha Samaja Darsana : (in Hindi) a collection of five articles on social concept of Buddhism. 1972. Re. 1.00

Pratityas amutpadastutisubhasita-hardayam of Acarya Tsonkhap : Tibetan text, Sanskrit, Hindi and English translations by Ven. Gyaltsen Namdol and Ven. Ngawang Samten. 1982. Rs. 60.00 (hb) Rs. 45.00 (pb).

Dhammapada : Pali text with Sankrit, Hindi, English and Tibetan translations : Edited by Prof. C.R. Lama. 1982. Rs. 75.00 (hb) Rs. 55.00 (pb).

Baudha Vijnanavada : Cintana Evam Yogadana : a collection of articles in (Hindi & English) Chief Editor : Ven. Samdhong Rinpoche; Editor : Shri Radhev Shaym Dhar Dwivedi. 1983. Rs. 45.00 (hp) Rs. 35.00 (pb).

Vimsati : Bhota Upasarga Prakriya by K. Angrup Lahuli. The root text is versified in Tibetan and the auto-commentary is in Hindi. 1985. Rs. 55.00 (hb) Rs. 45.00 (pb).

g-Tam-rGud-sGer-Thang-Ma of Gedun Chospel in Tibetan : edited by Losang Norbu Shastri with an introduction by Prof. S. Rinpoche. 1986. Rs. 26.00 hb, Rs. 20.00 pb.

Abhidhammatthasangaha voll (The 1st 5 chapters) of Acarya Anuruddha : the original Pali Text with Hindi and Tibetan translations and commentary in Tibetan by Prof. Sempa Dorjee. 1988. Rs. 175.00 (hb) Rs. 150.00 (pb).

Abhisamayalankara-mahasastram-kaya vyavasthatika of Khanpo Tsongkha : translated into Sanskrit and Hindi from Tibetan by Sri Pema Tenzin. 1988. Rs. 35.00 (hb) Rs. 30.00 (pb).

SAMYAK VAK SERIES:

Pratityasamutpada : a collection of essays on Pratityasamutpada presented by scholars in an All India Seminar organised by the Institute in 1981. Edited by Rama Shankar Tripathi ; 1986. Rs. 80.00 (hb) Rs. 65.00 (pb).

Madyamika Dialectic & Philosophy of Nagarjuna : a collection of thirty research papers on Madhyamaka Dialectic and the contributions of Acarya Nagarjuna to Buddhist thought Editor : S. Rinpoche : Associate Editor : C. Mani ; with an introduction by T.R.V. Murti. Reprinted 1985. Rs. 60.00 (hb) Rs. 45.50 (pb).

Sramana Vidya: Studies in Buddhism Prof. Jagannath Upadyaya Commemorial Volume I, a collection of articles in English by eminent scholars. Edited by Prof. N. H. Samtani. 1988. Rs. 150.00 (hb).

Sramana Vidya : Prof. Jagannath Upadyaya Commemorial Volume-II, a collection of articles in Hindi by eminent scholars. Edited by Prof. Ram Shankar Tripathi. 1989. Rs. 110.00 (hb).

PROF. LAL MANI JOSHI COMMEMORIAL LECTURE SERIES :

Naihsreyasa Dharma : a lecture by Prof. K. Sacchidanand Murti with a foreword by Prof. G.C. Pandey. 1984. Rs. 5.00.

Buddhist Art of India and Nepal : A lecture delivered by Prof. Krishna Deva on the subject 1987. Rs. 7.00.

THE RARE BUDDHIST TEXT SERIES :

Guhyadi-Astasiddhi-Sangraha : a collection of eight Tantric texts of various siddhas. Critically edited the Sanskrit version by Pt. Vraj Vallabha Dwivedi and his colleagues and the Tibetan version by Wangchuk Dorjee Negi. 1988. Rs. 115.00 (hb), Rs. 90.00 (pb).

Jnanodaya Tantra : a minor text of Buddhist Tantra edited by the members of the Rare Buddhist Text Project, 1988. Rs. 15.00 (pb).

THE RARE BUDDHIST TEXT JOURNAL-DHIH

DHIH journal is issued two times in a year on Vaisakha and Kartika Purnima days. It throws light on Buddhist Tantric texts and gives information on unpublished and newly discovered MSS. It also contains articles on Tantric subject and gives a good number of Tantric technical terms and their meanings in every issue :

DHIH-I	1986 Vai. Purn.	Rs. 65.00
DHIH-II	1986 Kar. Purn.	Rs. 38.00
DHIH-III	1987 Vai. Purn.	Rs. 42.00
DHIH-IV	1988 Kar. Purn.	Rs. 40.00
DHIH-V	1988 Vai. Purn.	Rs. 45.00
DHIH-VI	1989 Kar. Purn.	Rs. 40.00
DHIH-VII	1989 Vai. Purn.	Rs. 45.00

OTHER PUBLICATIONS

Manjusri : an illustrated catalogue of rare thankas by Ven. Ngawang Samten with message from H.H. the Dalai Lama

and a foreword by Dr. (Mrs.) Kapila Vatsyaya. 1986. Rs. 160.00.

BOOKS IN PRESS

Sautranyakadarsanam in Sanskrit by Prof. R.S. Tripathi.

Abhidhammatthasangaho vol. II (chapter VI to X) of Acarya Anuruddha : the original Pali text with Hindi and Tibetan translations and Tibetan commentary by Prof. Sempa Dorjee.

Dharma Dharmata Vibhanga of Arya Maitreyanatha with its commentary of Acarya Vasubandu : edited the Tibetan version, restored into Sanskrit and translated into Hindi by Ven. Tsultrim Phuntsok.

Chandoratnakara : edited the Tibetan and Sanskrit versions ; restored and translated into Hindi the autocommentary by Ven. Losang Norbu Shastri.

Vasantatilaka of Krsnapada with auto commentary. (Sanskrit and Tibetan texts).

Ratnavali of Acarya Nagarjuna with a commentary by Ajitmitra : edited Tibetan version, restored into Sanskrit the lost portion and translated into Hindi by Ven. Ngawang Samten.

History of Buddhism in Afghanistan : (in English) by Dr. C.S. Upasak.

Muktalatavadanam of Ksemendra : Sanskrit and Tibetan texts with Hindi and English translations by Shri Pema Tenzin.

Tatvasiddhi of Acarya Santarakshita : edited Tibetan version and restored into Sanskrit and translated into Hindi by Prof. Samdhong Rinpoche and Prof. K. N. Mishra.

FORTHCOMING

Tibet : an exhaustive bibliography (a comprehensive bibliography on and about Tibet, of books and periodicals written in non-Tibetan languages) : by Dr. R.D. Singh.

Prajnaparamitapindartha of Acarya Kumarsribhadra : restored into Sanskrit and translated into Hindi by Ven. Ngawang Samten.

Triratnakathayoga of Acarya Tsongkhapa : translated into Sanskrit and Hindi by Ven. Tsultrim Phuntsok.

Uttamamarga Ratnavali of Acarya JGampopa : translated into Sanskrit and Hindi by Ven. Losang Thogmed.

Mahayanadarsanapata-Satyadvaya-prakasa of Za Patul : translated into Sanskrit and Hindi by Ven. Sonam Rabten.

Satyadvayavatara, **Prajnaparamita-hrddayabhasa** yam Ekasmrtiyupadesa, and madhyamupadesa of Acarya Dipangkara-srijnana : edited the Tibetan version and translated into Sanskrit by Ven. Sonam Rabten.

Arya-Vajracchedika-Prajnaparamitica of Acarya kamalasila : edited Tibetan version, restored into Sanskrit and translated into Hindi by Sri Pema Tenzin.

Tibbati-Sanskrit Kosa of Tsering Wangyal transliterated from Tibetan into Devanagari and edited by Sri Pema Tenzin.

All communications may please be addressed to :

THE EDITOR,
PUBLICATION UNIT
Central Institute of Higher Tibetan Studies,
SARNATH, VARANASI-221007

STUDY IN BRITAIN

The British Council Division Libraries answer more than 25000 enquiries each year about studying in Britain. We have recently expanded to meet the demand and now have an Education Information Officer in each of our 4 offices. If you or your students need information—about courses, institutions, qualifications or scholarships in Britain, please contact one of these offices.

Ms Pushp Malik

Education Information Officer

British High Commission

British Council Division

AIFACS Building Rafi Marg

New Delhi 110001

Tel: 381401

Ms Anita Dumra

Education Information Officer

British Deputy High Commission

British Council Division

5 Shakespeare Sarani

Calcutta 700 071

Tel: 445370

Mr Sivakumar

Education Information Officer

British Deputy High Commission

British Council Division

737 Anna Salai

Madras 600 002

Tel: 869402

Ms Malavika Muralidharan

Education Information Officer

British Deputy High Commission

British Council Division

Mittal Tower 'C' Wing

Nariman Point

Bombay 400 021

Tel: 223560

British High Commission
British Council Division

CLASSIFIED ADVERTISEMENTS

MANIPUR UNIVERSITY

CANCHIPUR : IMPHAL

Advertisement No. 9/89

Dated : September 15, 1989

Applications are invited for the following posts :

Post	Department	No. of Post	Specialisation
PROFESSOR	Commerce	1	Organisation Theory and Behaviour
	Education	1	Open
LIBRARIAN	University Library	1	Open
ASSOCIATE PROFESSOR	Life Sciences	1 (temporary)	Genetics
	Economics	1	Agricultural Economics/ Industrial Economics/ Development Economics/ Econometrics
	Hindi	1	Folk Literature
	Computer Science	1	Open
	Anthropology	1	Social & Cultural Anthropology
ASSISTANT PROFESSOR	Anthropology	1	Physical Anthropology
	Mathematics	2	(a) Pure Mathematics (Functional Analysis Topology/Algebra) (b) Open (Preferably with the background of numerical analysis)
	Computer Science	2 (one is on leave vacancy)	Open
	Life Sciences	2	(1) Fisheries (2) Animal Physiology Ecology
		1 (leave vacancy)	Tibeto Burman Linguistics/ Lexicography
PROGRAMMER	Computer Science	1	Open

Scale of Pay

Professor : Rs. 4500-150-5700-200-
7300/-

Librarian : Rs. 4500-150-5700-200-
7300/-

Associate Professor : Rs. 3700-125-4700-150-
5700/-

Assistant Professor : Rs. 2200-75-2800-100-
4000/-

Programmer : Rs. 2200-75-2800-EB-
100-4000/-

Candidates invited for interview will be given 1st Class (for Professor & Librarian) and 2nd Class (for other posts) railway fares as T.A. from the place of origin and back or the actual expenses on fare, whichever is less.

Essential Qualifications

Professor : An eminent scholar with published work of high quality actively engaged in research in the relevant field. About 10 years experience of teaching and/or research. Experience of guiding research at doctoral level.

OR

An outstanding scholar with established reputation who has made significant contribution to knowledge in the relevant field.

Librarian : Essential

(a) First or Second class M.Lib.Sc. or M.A./M.Sc. / M.Com. plus a First or Second Class B.Lib.Sc. or Diploma in Lib.Sc.

(b) At least ten years experience as Librarian or in a responsible professional capacity in a University Library.

(c) Ph.D. Degree or equivalent research work in the field relevant to the profession

Desirable

Training in Computerisation/Information Technology/Specialised areas.

Associate Professor

(a) Good academic record with a doctorate degree or equivalent published work in the relevant field. Evidence of being actively engaged in (i) research or (ii) innovation in teaching methods or (iii) production of teaching materials.

(b) About 5 years experience of teaching and/or research provided that at least three of these years were as Assistant Professor/Lecturer or in an equivalent position.

This condition may be relaxed in case of candidates with outstanding record of teaching/research.

Associate Professor in Computer Science

Essential

Good academic record with a doctorate degree or equivalent published work in Computer Science

Desirable

About 5 years experience of teaching and research or work experience in computer applications provided that at least 3 years were as a Lecturer or in an equivalent position, associated with Computer System

OR

(a) (i) Master's degree in CS/CA or (ii) Master's degree in any discipline or B.E./B.Tech in CS/Electronics with DCA

(b) Minimum of 5 years experience in Computer System development and in conducting training programmes in Computer Science

Assistant Professor

(a) Master's degree in the relevant subject with at least 55% marks or its equivalent grade and good academic record.

(b) M.Phil and Ph.D. are desirable qualifications. The minimum qualifications prescribed in (a) above shall not, however, be relaxed even in respect of candidates who have research degrees like M.Phil/Ph.D.

Assistant Professor in Computer Science

(a) Master's degree in Computer Science/Computer Application / Busi-

ness Administration or Master's Degree in any discipline or B.E./B.Tech in Computer Science/Electronics with DCA; and

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY

School of Biomedical Engineering

BIOMEET '90

(Biomedical Engineering Entrance Test)

for

Medical Graduates Seeking Admission with

Scholarship

to

M.Tech/Ph.D. Programme in Biomedical Engineering

Eligibility MBBS degree holders and those undergoing internship.

Application Forms and information brochure can be obtained by post from Chairman, GATE, Indian Institute of Technology, Powai, Bombay 400 076 by enclosing a crossed draft of Rs. 40/- drawn in favour of Indian Institute of Technology, Bombay and payable at Bombay.

Examination Centres IIT Bombay, IIT Delhi, IIT Kharagpur, IIT Kanpur, IIT Madras, IISc Bangalore

Dates Issue of Forms: 30th Oct '89 to 20th Nov '89 Examination Sunday, 18th Feb '90.

Note

1. Candidates from engineering and physical sciences should appear for GATE for admission to the above programme.
2. Besides qualifying through BIOMEET/GATE, the candidates must satisfy other requirements before admission.

BARKATULLAH UNIVERSITY, BHOPAL

ADVERTISEMENT

No. 2015

Dated : 15.9.1989

Applications on plain paper in eight (8) copies accompanied by crossed postal order of Rs. 10 in favour of the Registrar, Barkatullah Vishwavidyalaya, Bhopal are invited for the post of Assistant Librarian (one post). Pay Scale Rs. 2200-75-2800-100-4000. Qualifications : (a) Good Academic record with at least a high second class Master's degree in a subject other than Library Science. (b) Master's degree in Library Science with first class or high second class. Last Date for receipt of application is 12.10.89. No TA/DA will be admissible to the candidate.

MP Madhyam/456

N.S. Verma
REGISTRAR

(b) A minimum of two years' experience in Computer Systems development.

Programmer

At least 2nd Class M.Sc. with 55% marks or its equivalent grade in Physics/Mathematics/Statistics with DCA and 1 year experience in Computer Programming

OR

Ist Class B.E./B.Tech with DCA and 2 years' experience in Computer Programming

How to Apply : Applications, on plain paper (in duplicate) with attested copies of certificates in support of qualifications and experience showing candidate's name, father's name, date of birth, address for correspondence, academic and professional attainment, teaching/working & research experience, field of specialisation, publications (to be enclosed with reprints), seminars/conferences attended, details of visit to foreign countries and assessment reports from at least two persons well acquainted with the candidate's professional work should reach the REGISTRAR, MANIPUR UNIVERSITY, IMPHAL—795003 on or before 14-10-1989.

Applications received late or incomplete in any respect may not be entertained. Persons already in service must apply through their employers so as to reach this office on or before the last date fixed. No candidate will be considered for appointment unless he/she produces a 'No Objection Certificate' from his/her employer at the time of interview.

Retired persons who have not attained the age of 62 years may also apply for appointment on contract basis. It will be open to the University to consider the names of suitable candidates who may not have applied. Deserving candidates who do not fulfil all the qualifications for faculty positions mentioned above may be considered in the lower scale of pay equivalent to that of Associate Professor or Assistant Professor as the case may be.

Th. Joychandra Singh
REGISTRAR

OUR FEW IMPORTANT TEXT BOOKS

General Botany (Vol I) Pages 1500

A.K. Ganguly

N.C. Kumar

125.00

CONTENTS

1. Morphology, 2. Anatomy, 3. Embryology, 4. Pathology,
5. Plant Taxa, 6. Thallophyta, 7. Algae, 8. Fungi, 9. Bacteria,
10. Bryophytes, 11. Pteridophytes, 12. Gymnosperms, 13. Angiosperms.

General Botany (Vol. II) Pages 1200

A.K. Ganguly

N.C. Kumar

100.00

CONTENTS

1. Cytology 2. Genetics 3. Plant Breeding 4. Organic Evolution
5. Plant Physiology 6. Ecology 7. Phytogeography 8. Economic Botany
9. Palaeobotany

A Textbook of Plant Physiology (17th Edn.)

V. Verma

45.00

पादप शरीर क्रिया विज्ञान (Hindi Edition of above)

25.00

A Textbook of Plant Ecology (4th Edn.)

V. Verma

25.00

A Textbook of Economic Botany (4th Edn.)

V. Verma

25.00

A Textbook of Plant Anatomy

E.J.J. Prakash

25.00

Outlines of Microtechnique (2nd Edn.)

Prasad & Prasad

8.00

Fungi of India 1962-73

K.G. Mukherjee

75.00

& R.C. Juneja

10.00

A. Shivaraj

10.00

An Introduction to Physiology of Cereal Crops

A K. Berry

20.00

A Textbook of Biochemistry

R.N. Bhattacharyya

150.00

Experiments with Micro-organism

Ashok Kumar

45.00

Agricultural Entomology

P.M. Nigam

20.00

Test Your Botany (For Medical Entrance Test)

V. Verma

20.00

A Textbook of Animal Physiology

A.K. Berry

30.00

(3rd Edition)

प्राणी कार्यकी की पाठ्य पुस्तक (Hindi Edition of above)

A. K. Berry

35.00

A Textbook of Biochemistry

A. K. Berry

20.00

Elements of Animal Ecology and

R. Nagabhushanam

6.00

Zoo-Geography

Dr. (Mrs.) K. Kadam

20.00

The Invertebrates

B.S. Tomar

10.00

Practical Embryology and

Physiology of Animals

A.K. Berry

20.00

A Textbook of Animal Histology

A.K. Berry

25.00

An Introduction to Embryology

A.K. Berry

25.00

प्राणी भूज्ञ विज्ञान

ए के बेरी

30.00

Practical Chordate Zoology

B.S. Tomar

30.00

Comparative Osteology

B.S. Tomar

15.00

Applied Zoology

S.K. Dass & Others

50.00

Practical Invertebrate Zoology

A.K. Berry

18.00

An Introduction to Chordate Embryology

B.S. Tomar

25.00

Fish Osteology

B.S. Tomar

20.00

A Textbook of Biological Chemistry

A.K. Berry

75.00

Economic and Applied Entomology

Ashok Kumar

75.00

P.M. Nigam

75.00

Economic and Applied Entomology (Paper-back)

A.K. Berry

45.00

Objective Zoology

A.K. Berry

30.00

Test Your Zoology (For Medical Entrance Test)

A.K. Berry

45.00

Hirudinaria : The Indian Cattle Leech

Dr. M.L. Bhatia

60.00

Write for Complete Catalogue :

EMKAY PUBLICATIONS

Post Box No. 9410

B-19, East Krishna Nagar, Delhi—110051

Phone : Office—2212191, Residence—2286123

Sambalpur Pin.-768019

CORRIGENDUM TO

Advertisement No. 15046/Estdt. III

Dated 23.8.89

DEPARTMENT OF BUSINESS
ADMINISTRATION

LAST DATE EXTENDED FOR

RECEIPT OF APPLICATION—16.10.89

Post Add. Specialization

A. Professor (d) Industrial Management

Reader (f) Industrial Management

Note : No Reservation for Scheduled
Caste/TribeB. Lecturer—Total 5 posts only 1 reser-
ved for Scheduled Caste
Scheduled Tribe.C. Selection to the posts need not be re-
stricted to those who Apply.D. Higher Initial pay in UGC Scale ad-
missible in Deserving Cases.E. University Reserves the Right not to
fill any Post.

REGISTRAR

Common Entrance Examination
for Design

CEED '90

Industrial Design
Industrial Products
Consumer Products
Automobiles
Ceramics
Exhibitions

Entrance Examination for
Master of DesignTwo Year Programme at
Industrial Design CentreIIT Bombay
1990—'91
Admissions

Graphic Design
Typography
Photography
Audiovisuals
Video and Animation
Computer Graphics
Visual Communication

*Candidates may appear for either
CEED or GATE. All those admitted
are eligible for postgraduate
scholarship.

Eligibility
Engineering
Bachelor's degree
(any branch)
Architecture
Bachelor's degree
Art / Design
G.D. Art (5 years)
BFA (Applied Art)
Diploma of NID

Final year students are also
permitted to appear

For application material,
please send a
crossed demand draft for
Rs. 40/- drawn in favour of
Indian Institute of
Technology, Bombay and
payable at Bombay to :

Chairman, CEED
C/o GATE Office
Indian Institute of
Technology
Bombay 400 076
Ph. : 5144145

Test will be held on
18 February 1990 at Bombay,
Delhi, Kanpur, Kharagpur,
Madras and Bangalore.

Last Date for Issue
20 November 1989

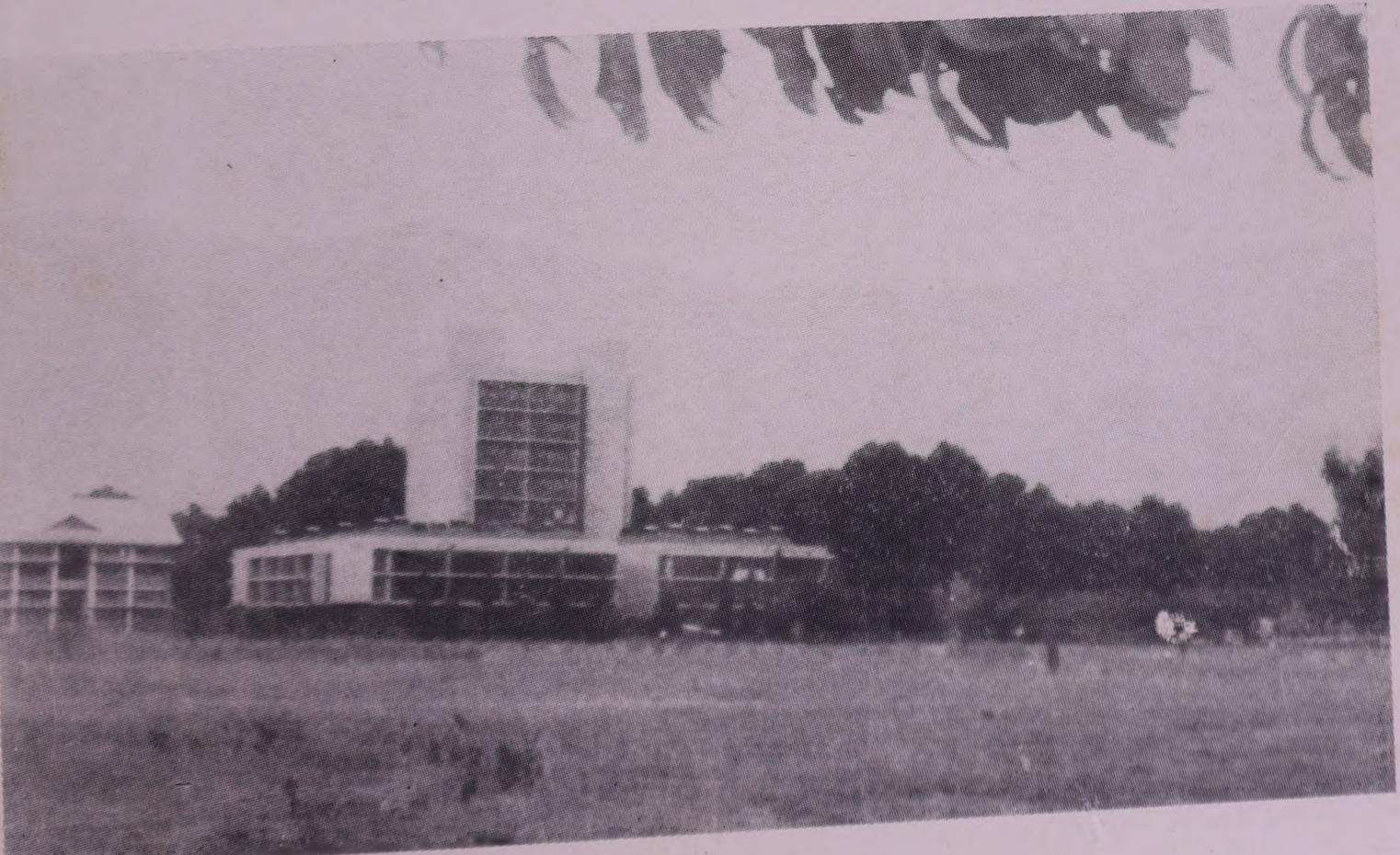
It Pays
to
Advertise
in
University News

University of Kashmir

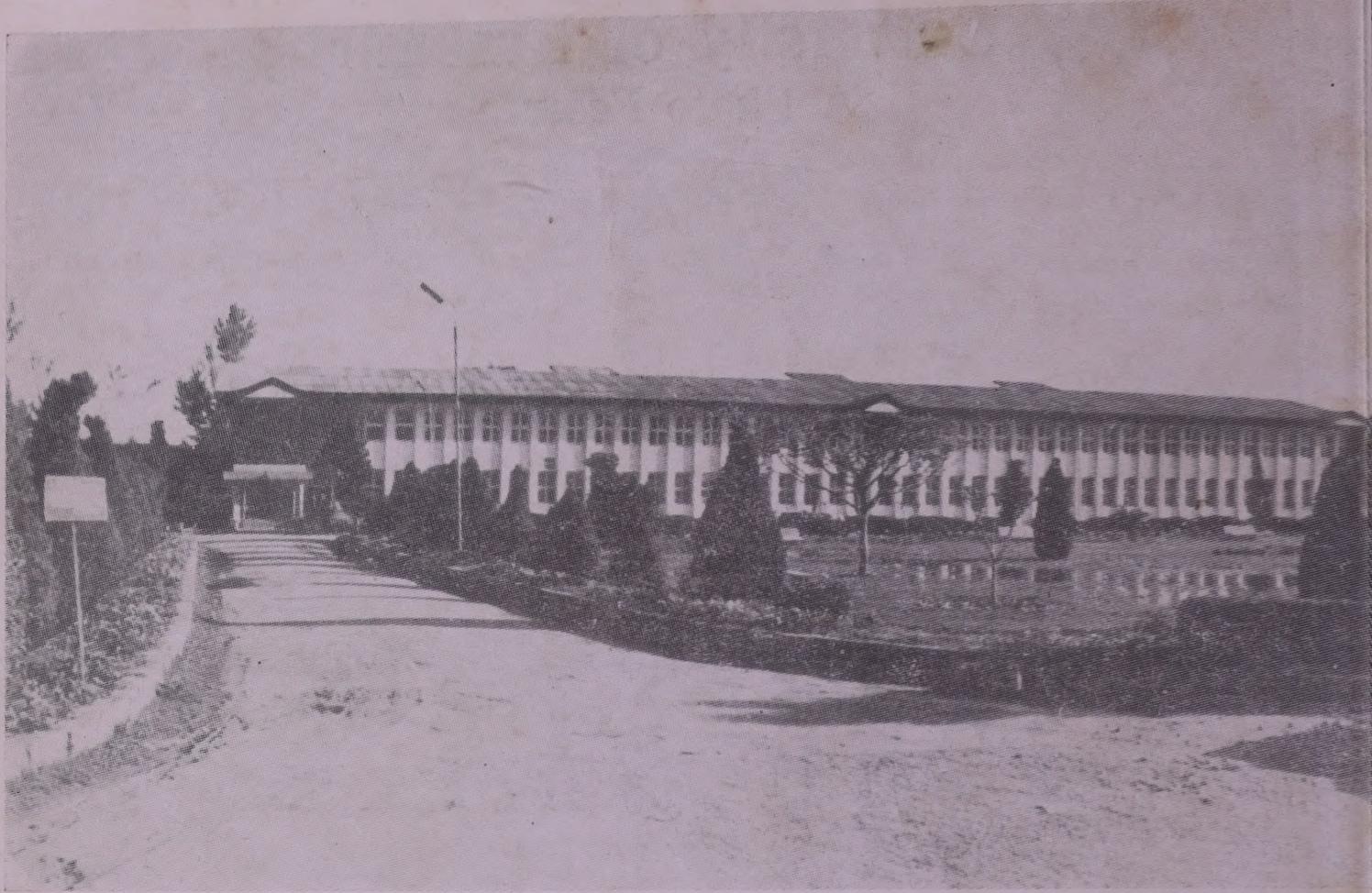
A Photo Feature



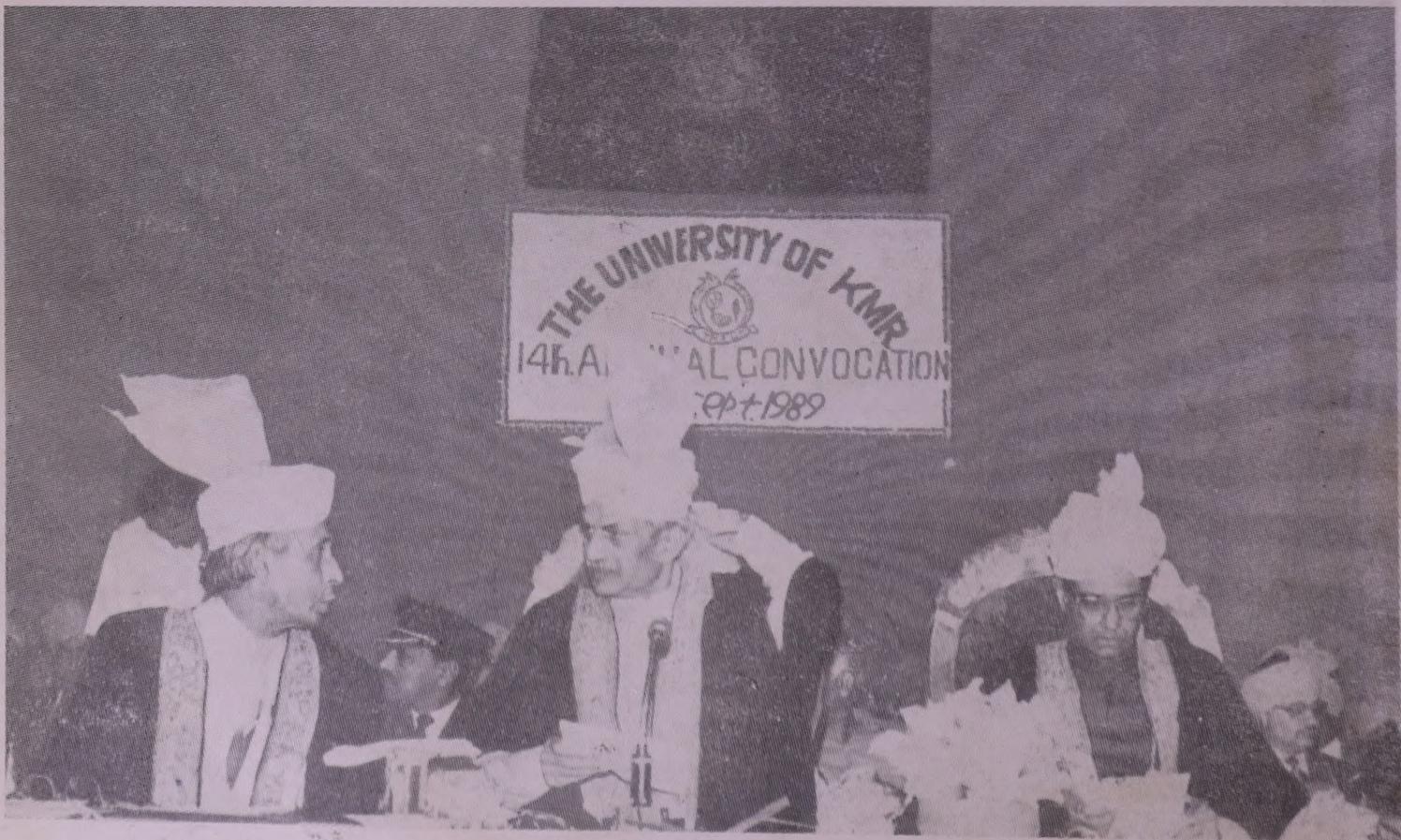
Arts Block



Iqbal Library



Administration Block



14th Annual Convocation : From L to R : Prof. Mushirul Haq, Vice-Chancellor, H.E. Lt. Gen (Retd.) K.V. Krishna Rao, Chancellor and Prof. K. Satchidananda Murty, Chief Guest.